



Marie Skłodowska-Curie
Actions

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Training in Reducing Uncertainty in Structural Safety

D2.5 Final Report

WP2 - Dissemination and Outreach

Revision [final version]

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Executive Summary

This report describes the outputs of work package WP2 (Dissemination and Outreach) from 1st January 2015 to 31st December 2018. Dissemination by TRUSS is keenly aware of the importance of not only producing and presenting research outputs for the scientific community and key stakeholders (i.e., via conferences, workshops, publications and reports), but also engaging the general public in line with the Innovation Union objectives. TRUSS mainly deals with the challenges faced at the design, assessment and management stages of large scale structures. Outreach activities, blogs and social media and other communications by TRUSS, bring awareness to the public on the importance of this research on infrastructure to support a community, region or country, and also motivate School and University students to pursue a research career. These activities make citizens aware of:

- Infrastructure aging and failing, with funding that has been insufficient to repair and replace it;
- The important role of the Marie Skłodowska-Curie Actions in forming 21st century engineers that will have the skills to face the formidable challenge of modernizing the fundamental infrastructure that support civilization.

Chapter 1 reviews the two workshops that were held in national forums to highlight TRUSS ITN progress and achievements to date. The workshops were organized through interaction with local professional organizations and gave the Early Stage Researchers (ESRs) the opportunity to present their research to interested stakeholders and to improve their knowledge and expand their horizons even further.

- A first workshop was hosted by Lloyd's Register in their London quarters (UK) on 24 May 2017. At that point, the ESRs had a definitive understanding of the broad scope of the project, a firm knowledge of its specific objectives and they were in a position to present preliminary results. Here, the ESR used the training from their communication modules, in combination with their research skills training and the initial part of their doctoral research, to produce a poster presentation reviewing progress to date. Guest speakers from outside the consortium were invited to give talks in the workshop.
- A second workshop was hosted by UCD in Dublin (Ireland) on 29 August 2018. Here, TRUSS liaised with the Civil Engineering Research Association of Ireland (CERAI) to host the TRUSS event in parallel with the Civil and Engineering Research conference. Project Coordinator (PC) and all ESRs delivered PowerPoint presentations. They also interacted with the public at a TRUSS kiosk made available in the main hall where brochures, magazines and books about TRUSS research were distributed for free to the participants.

Chapter 2 provides a sample of the outreach activities that have served to engage a large audience and brought knowledge and expertise in a two-way communication between the researcher and the public. In TRUSS, outreach activities took the following forms:

- 6 Open Days: These annual events for school students are generally attended by parents and children and frequent questions are asked on the prospects of each career. TRUSS ITN hosted exhibition stands at Open Days in UCD, UNOTT and TCD to inspire many students.
- 4 Research exhibitions where posters about TRUSS ITN were produced for display throughout the day, as well as some of the technology platforms to support the research. In these events, ESRs had had opportunities for networking and meeting with the general public, individual researchers and with other industry representatives. It is worth to highlight the exhibitions by ESRs in UCD Earth Institute (30 September 2015, Dublin, Ireland), UNOTT Engineering and Science Learning Centre (4 May 2017, Nottingham, UK), TRA VISIONS (16 April 2018, Vienna, Austria) and EUCYS (16 September 2018, Dublin, Ireland).
- 5 talks to final year University students. The Universities in TRUSS ITN organised talks by PC and ESRs to students in the final year, where they presented their personal and professional experience, and the possibility of choosing a research career.
- 7 activities in School students: TRUSS has promoted the project and engineering as a career via 1 talk in a Language School, 1 talk and 1 activity for High School students, and 4 activities in Junior Schools in different seasons.

Chapter 3 reviews TRUSS ITN profiles on popular social media such as Facebook, Twitter, LinkedIn, Google+ and ResearchGate adding to 572 followers. More specifically:

- TRUSS Facebook with 262 posts, 29,917 reach and 6,057 engagements,
- TRUSS Google+ with 215 posts distributed within 5 collections and between 69 and 82 followers depending on the collection,
- TRUSS LinkedIn with 161 followers and 157 connections,
- TRUSS Twitter with 445 tweets, 167,292 impressions and 168 followers,
- TRUSS ResearchGate with 24 followers and 409 reads.

Additionally, ESRs regularly maintained blogs in BlogSpot to inform of their current activities in a language that could be easily understood by the public. The blogs were accompanied by appropriate tags to ensure maximum exposure in internet searches. ESRs delivered 146 posts that were viewed 45,340 times.

Other communication channels envisaged in TRUSS ITN are described in Chapter 4. Among these channels, it is worth to mention:

- The TRUSS website (<http://trussitn.eu>), probably was the vehicle of greatest impact. It has 190 pages with information for the public/wider community about the project's aims, activities and material available (e.g. outreach in primary, secondary and high school education, material for stakeholders, etc.), as well as

highlighting the ongoing work. There are also external links to ESR's blogs, to their publications made available in repositories, and to other websites containing info of interest. By December 2018, the website had experienced 108,343 page views, had been visited by 22,358 new users adding to 38,495 sessions averaging 2.81 pages per session and 2 minutes and 57 seconds per session. The top 20 countries with more visitors to TRUSS website were United States (14%), Ireland (10%), United Kingdom (10%), Russia (8%), Spain (6%), France (4%), India (4%), Italy (3%), Germany (3%), China, Iran, South Korea, Greece, Canada, Portugal, Netherlands, Brazil, Japan, Turkey and Belgium.

- Other websites such as the Cordis website, which has become a major source of consultation by professionals, OpenAire Database, TRUSS repository in UCD, and Impact Magazine, Open Access Government and Engineers Ireland websites, where TRUSS articles have been published online.
- 50 hard-copies of Impact Magazine with a 3-page article about TRUSS, 100 hard-copies of 91-page book about TRUSS also available online, in addition to 4,050 brochures (two types of brochures) written in an easy-to-understand language were produced for distribution in local events such as Open Days (to school students and graduates) in the Universities participating in the consortium, at TRUSS national workshops and international symposia.
- ESRs and communication offices of the partners contributed to feature TRUSS in press releases in mainstream Italian and Spanish newspapers, in Italian and Irish magazines and in Irish television.
- High-quality presentations and videos were made available to the general public through TRUSS SlideShare and YouTube channel as follows:
 - The YouTube channel featured 22 videos with 8,053 views, including interviews to each ESR where they explained their background, the advantages of an ITN, the objectives of their projects and the impact and benefits for society.
 - SlideShare contained 43 presentations viewed 9,275 times, including all PowerPoint delivered at TRUSS workshops and symposia, which can also be downloaded in the website.

Finally, Chapter 5 provides details for the technical contributions of TRUSS to science that can be categorized into:

- 23 publications in high impact international peer-reviewed journals and magazines.
- 122 conference contributions. These contributions consist of delivering 122 PowerPoint or poster presentations -including 15 posters in TRUSS workshops- and publishing 97 full papers in proceedings of workshops and international conferences targeting industry, researchers, stakeholders, policy makers and government departments.
- Technical/Scientific deliverables, i.e., the final public reports for TRUSS work packages, and doctoral theses of ESRs. To this date, two ESRs have been awarded the

degree of doctor, and eight ESRs have submitted thesis that will soon be subjected to PhD examination.

Through participation in conferences, the ESR gained the experience of presenting in front of an international audience, and had an opportunity for networking and discussing current research focuses and design/construction practice, while including worldwide experts from all areas of infrastructure. TRUSS participated in conferences/workshops in the 5 continents including 23 countries: Albania, Australia, Austria, Belgium, Brazil, Canada, China, Denmark, France, Greece, Holland, Hungary, Ireland, Italy, Japan, Norway, Portugal, Slovenia, South Africa, Spain, United Kingdom, the United States and Vietnam. In addition to conferences attended by TRUSS researchers at an individual level, two dedicated Symposia about TRUSS ITN were held at well-established international conference series whereby all ESRs showcased their research:

- A first symposium titled “TRUSS, A Marie Skłodowska-Curie Innovative Training Network in Structural Safety”, held as part of ESREL (European Safety and Reliability) conference series in Portoroz (Slovenia) from 18 to 22 June 2017.
- A second symposium titled “TRUSS ITN – Reducing Uncertainty in Structural Safety” marked the completion of the research by ESRs. It took place within the Sixth International Symposium on Life-Cycle Civil Engineering (IALCCE 2018), held in Ghent (Belgium) from 28 to 31 October 2018.

By December 2018, TRUSS had published a total of 120 technical papers, with approximately 60% of these publications including both academic and industrial co-authors, which is evidence of the strong academia-industry partnerships in the consortium. TRUSS ITN publications have been made available online through research repositories at UCD, UNOTT, UPC and TCD, with no license restrictions where allowed by the publishers. Free to download publications are also available at CORDIS website and OpenAIRE database.

The EU emblem and funding acknowledgement to the Marie Skłodowska-Curie Actions was made visible in the brochure, banner, videos, posters, press releases and publications, the footer of the website and any other materials delivered by the TRUSS project.

Chapter 1: Workshops

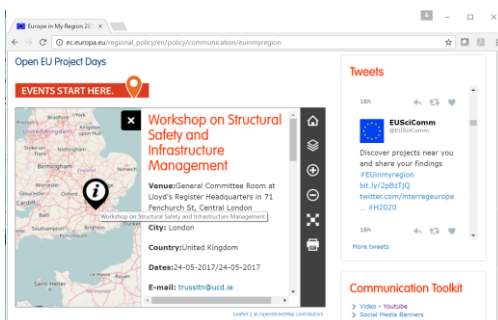
1.1 WORKSHOP 1

Lloyd's Register hosted the first TRUSS workshop on Structural Safety and Infrastructure Management from 1.30 to 6 pm on Wednesday 24 May 2017 at the General Committee Room in 71 Fenchurch St, Central London.



The workshop venue

In order to attract a local audience, the workshop addressed challenges raised by London Infrastructure Plan 2050, i.e., how to maintain buildings, energy and transport infrastructure that constitute the basic pillars for providing social and economic benefits to a growing London. The conclusions of the workshop can be easily extended to the context of other European cities. The workshop was organized through interaction with local professional organizations (i.e., Lloyd's Register Trust Fund, Network Rail, John Dora Consulting, and Imperial College London). Guest speakers from outside the consortium were also invited to give talks. The workshop featured talks by a panel of 6 renowned experts, discussions and a poster exhibition showcasing 14 related projects by TRUSS Early Stage Researchers. The targeted audience were policy makers, owners, operators, managers, research scientists, engineers and practitioners interested in life cycle maintenance, risk and probabilistic analysis of engineering structures and structural health monitoring. Direct invitations by email and flyers were posted to people with profiles fitting the themes of the workshop. Additionally, an extensive social media campaign with ads using YouTube videos, Twitter, Facebook, LinkedIn, and Google+ as well as the interactive map of the campaign "Europe in my Region 2017" were employed to promote the event.



TRUSS in "Europe in my Region" 2017 campaign

This campaign ran between 2 May and 28 August 2017 to raise awareness on the achievements and benefits of co-funded projects to the regions. The attendance to the workshop was free, but registration was essential due to limited seats available, which was managed via Eventbrite.

There were a total of 43 attendees, including independent consultants, and non-academic institutions such as Arup, Equipos Nucleares SA, Full Scale Dynamics Ltd, John Dora Consulting, Lloyd's Register, Microlise Ltd, MPW R&R Ltd, Network Rail, Phimeca Engineering, Rolls Royce, Transportation Research Laboratory and WPA Design & Build Ltd. Academic researchers from Aalborg University, Cranfield University, Imperial College London, King's College London, Trinity College Dublin, University College Dublin, University College London, Universitat Politècnica de Catalunya and University of Nottingham also attended the event. When arriving to the venue, the delegates received a package consisting of the workshop flyer together with Lloyd's Register and TRUSS branded items.



Giveaway items

Kian Banisoleiman (Lloyd's Register) chaired the workshop and introduced all speakers.



Kian Banisoleiman

The event was opened by Mark Stokes, Group Communications Director at Lloyd's Register, who welcomed the attendants, and briefly talked about the building and the educational role of Lloyd's Register. Together with the 14 ESRs and their individual TRUSS projects, experiences in structural safety, probabilistic analysis and health monitoring by worldwide experts were scheduled as follows:

- 1:30-2:00 Registration, coffee/refreshments and poster exhibition
- 2:00-2:05 Welcome and Introduction by Mark Stokes (Lloyd's Register)



Mark Stokes

- 2:05-2:25 “Bridge Asset Management at Network Rail” by Robert Dean (Network Rail)



Robert Dean

- 2:25-2:45 “Thoughts about the Risks in Adopting Risk-Based Strategies” by John Dora (John Dora Consulting Ltd)



John Dora (John Dora Consulting Ltd)

- 2:45-3:05 “Resilient Infrastructure: the Role of Structural Health Monitoring” by Prof James Brownjohn (Full Scale Dynamics Ltd and University of Exeter)



Prof James Brownjohn

- 2:45-3:05 “Probabilistic Assessment of Bridges – Case Study Presentation” by Prof Alan O’Connor (Trinity College Dublin and Roughan & O’Donovan Innovative Solutions)



Prof Alan O’Connor

- 3:25-4:00 Q&A
- 4:00-4:30 Break for coffee/refreshments and poster exhibition
- 4:30-4:50 “Decision Theoretical Framework to Offshore Structural Integrity Management” by Prof Michael Havbro Faber (Aalborg University)



Prof Michael Havbro Faber

- 4:50-5:10 “Methods and Tools for Reliability Assessment” by Dr Thierry Yalamas (Phimeca Engineering)



Dr Thierry Yalamas

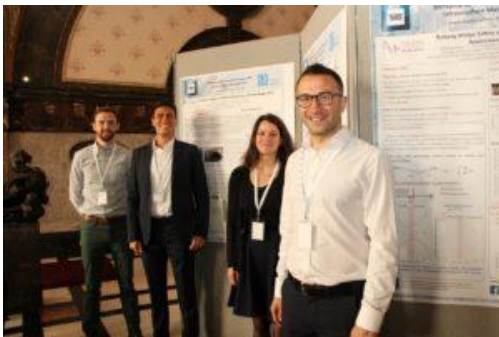
- 5:10-6:00 Discussion and Closure

During the workshop, ESRs had the opportunity to improve their knowledge and expand their horizons further, and also to practise their networking and communication skills via a poster presentation to interested stakeholders. The poster exhibition included examples of how uncertainty in structural safety was addressed in buildings, and transport (bridges and

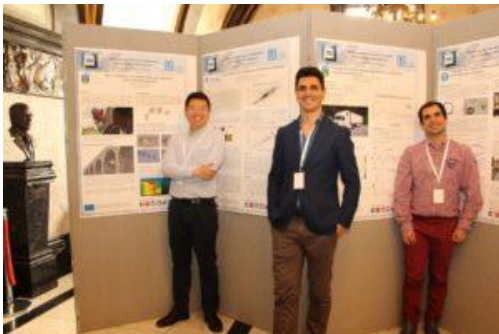
pavements, ships and ship unloaders) and energy infrastructure (wind turbines, nuclear components) via the academia-industrial partnerships in TRUSS. Discussions continued during the network dinner that took place after the workshop. Some pictures taken at the poster exhibition can be seen below.



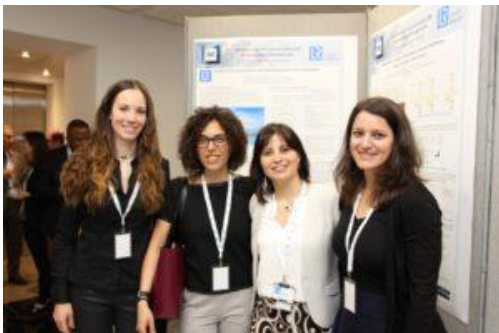
Farhad, JJ, Shah Nur, Rui, Federico, Matteo and Antonio



JJ, Matteo, Barbara and Farhad



Siyuan, Federico and Daniel standing besides their posters



Sofia, Giulia, Loreto and Barbara

All posters by ESRs, presentations by speakers and further details are available on <http://trussitn.eu/page?p=16562>.

1.2 WORKSHOP 2

Following a successful workshop in London, TRUSS liaised with the Civil Engineering Research Association of Ireland to host a second workshop in parallel with the Civil and Engineering Research in Ireland (CERI) conference (29-30 August 2018) chaired by Vikram Pakrashi (UCD). CERI attracted more than 220 delegates, coming from industry, academia and local and national policy makers and infrastructure managers in the area of civil engineering in Ireland, which is exactly the type of local audience that TRUSS envisaged the workshops for. For these reasons, the final TRUSS ITN workshop took place from 10:15 to 17:30 on Wednesday 29 August 2018 at the Sutherland School of Law in the Belfield campus, Dublin (Ireland), concurrently with the CERI conference, to attract an Irish audience of interested parties as large as possible. The workshop consisted of fifteen 15-minute long presentations: one by the PC introducing the project, followed by a presentation by each of the 14 ESRs.

TRUSS increased its visibility by sponsoring the conference. I.e., the name and logo of the TRUSS ITN project were shown in the opening address, proceedings, brochure and website, and best paper prizes ceremony of the CERI conference.



Award ceremony

Therefore, a kiosk dedicated to the TRUSS Marie Skłodowska-Curie ITN project was made available at the exhibition hall during the two days of the conference. The latter allowed TRUSS workshop to be accessed by more than 220 delegates, giving an opportunity to our ESRs to interact with the attendees beyond the time allocated to their presentations. ESRs took turns at the stand to address queries by the delegates as follows: Matteo Vagnoli and JJ Moughty (10:00 to 11:00), Antonio Barrias and Siyuan Chen (11:00 to 11:30), Barbara Heitner and Farhad Huseynov (11:30 to 12:45), Rui Teixeira and Federico Perrotta (14:00 to 15:00), Sofia Antonopoulou and Shah Nur Alam Sourav (15:00 to 16:00), Alberto Gonzalez and Daniel Martinez (16:00 to 16:30), and Giulia Milana and Guang Zou (16:30 to 17:45).

The exhibition kiosk showcased banners, a poster, 21 videos about the project, and two types of brochures, flyers, books containing a compilation of all individual research projects and about the project aims overall, impact magazines featuring TRUSS as example of linkage between research and industry, that were distributed for free to the attendants.



ESRs and PC at TRUSS kiosk



TRUSS materials at the kiosk

The talks by the 14 ESRs and the PC were divided into four sessions: (i) sensors and (iii) modelling issues as well as giving a picture of all activities by the project chaired by Arturo Gonzalez (UCD), (ii) reliability and material topics chaired by Salam Al-Sabah (Arup), and (iv) techniques to detect damage in bridges chaired by Eugene OBrien (UCD). Each session had coffee/lunch breaks in between as follows:

- 8:00 Registration, coffee/refreshments, and exhibition at TRUSS stand.



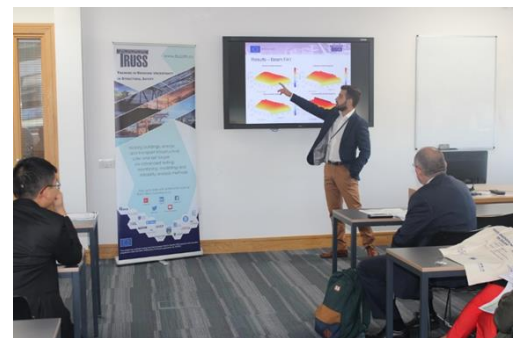
Rui Teixeira at TRUSS kiosk

- 10:10-10:25 “The TRUSS ITN project (2015-2019): a Marie Skłodowska-Curie innovative training network on reducing uncertainty in structural safety” by Arturo Gonzalez (University College Dublin, Ireland).



Arturo Gonzalez

- 10:25-10:40 “Fatigue testing of reinforced concrete beams instrumented with distributed optical fiber sensors (DOFS)” by Antonio Barrias (Universitat Politècnica Catalunya, Spain).



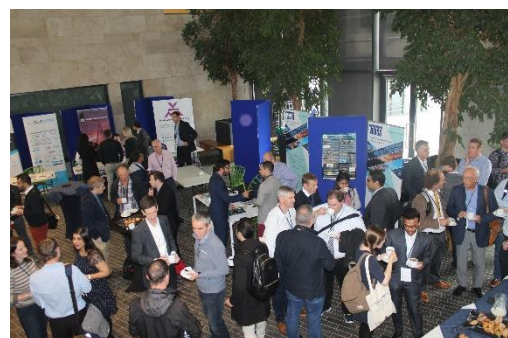
Antonio Barrias

- 10:40-10:55 “Automated bridge deck evaluation through UAV derived point cloud” by Siyuan Chen (University College Dublin, Ireland).



Siyuan Chen

- 11:00-11:30 Break for coffee/refreshments and exhibition at TRUSS stand.



TRUSS kiosk during coffee break

- 11:30-11:45 “On the effectiveness and uncertainty of inspection methods for fatigue crack management” by Guang Zou (Lloyd’s Register EMEA, UK).



Guang Zou

- 11:45-12:00 “On the application of Gaussian process regression for structural analysis” by Rui Teixeira (Trinity College Dublin, Ireland).



Rui Teixeira

- 12:00-12:15 “Statistical reliability of the screw pullout test in the assessment of in-situ concrete strength” by Shah Nur Alam Sourav (Arup, Ireland).



Shah Nur Alam Sourav

- 12:15-12:30 “A comparative study on different BFRP Rebar design methodologies” by Sofia Antonopoulou (University College Dublin, Ireland).



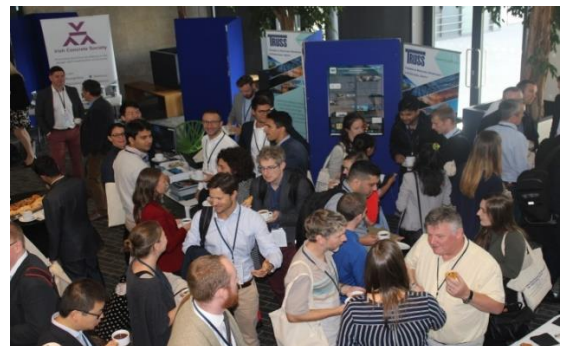
Sofia Antonopoulou

- 12:30-12:45 “A big data approach for investigating the performance of the road infrastructure” by Federico Perrotta (University of Nottingham, UK).



Federico Perrotta

- 12:50-15:10 Lunch break and exhibition at TRUSS stand.



TRUSS kiosk during break

- 15:10-15:25 “Vibration tests of an underwater free-standing 2-rack system” by Alberto Gonzalez Merino (Equipos Nucleares SA, Spain).



Alberto Gonzalez Merino

- 15:25-15:40 “Reduction of uncertainties associated to the dynamic response of a ship unloader” by Giulia Milana (Lloyd’s Register EMEA, UK).



Giulia Milana

- 15:40-15:55 “Sensitivity of SHM sensors to bridge stiffness” by Daniel Martinez (University College Dublin, Ireland).



Daniel Martinez Otero

- 16:00-16:30 Break for coffee/refreshments and exhibition at TRUSS stand.
- 16:30-16:45 “Nothing on the road axle detection system using direct strain measurements – a case study” by Farhad Huseynov (Full Scale Dynamics Ltd, UK).



Farhad Huseynov

- 16:45-17:00 “Finding the influence line for a bridge based on random traffic and field measurements on site” by Barbara Heitner (Phimeca Engineering, France).



Barbara Heitner

- 17:00-17:15 “A machine learning classifier for condition monitoring and damage detection of bridge infrastructure” by Matteo Vagnoli (University of Nottingham, UK).



Matteo Vagnoli

- 17:15-17:30 “Vibration-based, output-only damage identification of bridge under vehicle induced excitation” by John James Moughty (Universitat Politècnica Catalunya, Spain).



John James Moughty

In addition to all ESRs and chairs, other TRUSS participants at the Workshop included Wendy Mann (Lloyd’s Register), Joanna Buckingham (AECOM) and Parisa Beizaei (UCD). The poster at the TRUSS kiosk, presentations by speakers, and further details are available on <http://trussitn.eu/page?p=20198>.

Chapter 2: Outreach activities

2.1 OPEN DAYS

For TRUSS ITN and for the engineering field, events such as Open Days are useful in showing developments in the sector to the public at a closer range, and in alerting about the challenges faced by today's highly dynamic society. TRUSS ITN hosted exhibition stands at open days in UCD, UNOTT, UPC and TCD. A total of six Open Days counted with the participation of TRUSS as described below:

- Fly, Scan, Print held in Dublin on 22/06/2016 and supported by Prof. Laefer and ESR14 Siyuan Chen. It was reached by at least 150 people.
- Open Day at TCD held in Dublin on 10/12/2016 and supported by ESR4 Rui Teixeira. It was reached by more than 1000 people.
- Open Day 2018 at UNOTT held in the UK on 30/06/2017 and supported by ESR9 Matteo Vagnoli and ESR13 Federico Perrotta. It was reached by more than 1000 people.
- Open Day 2017 at UNOTT held in the UK on 15/09/2017 and supported by ESR13 Federico Perrotta and reached by more than 1000 people.
- UCD computer science Open Day, School of Science, UCD, Dublin, Ireland held on 22/11/2016 and supported by ESR14 Siyuan Chen.

A sample of descriptions for some of these events follows.

2.1.1 Open Day in UCD: Fly, Scan, Print

ESR14, Siyuan Chen, participated in the organisation of the free event "Fly Scan Print" by U3D that took place on the Wednesday 22nd June 2016. Most of visitors were aged from 18 to 30, with a majority of college students. Also some parents brought their children to enjoy the activity. There was at least 150 people that attended the exhibition throughout the day. The outreach activity was held in UCD campus and it was opened to the public from 9 am to 6 pm. It included laser scanning and interactive touch 3D demos as well as UAV hands on demo. Siyuan gave visitors free basic UAV flight training. Besides the all-day hands on UAV – flying, attendants had the chance to meet the experts in the trade, chat one on one, enjoy 3D anaglyphic images and videos. There was also a metal printer and Ultimaker available, food vendors to help survive the day and of course the public could sample 3D printed pancakes. A 3D printing competition was held, introductory classes to 3D printing and 3D design were imparted, and drone racing took place in one of the rooms. Almost 40 people joined the drone racing where Siyuan was in charge of the racing room safety.



Siyuan Chen participates at "Fly, Scan, Print"



"Fly, Scan, Print" open day, UCD (22/06/2016)

2.1.2 Open Day in TCD

TCD held an Open Day on Saturday, 10th December 2016, from 9 am to 3.30 pm. The Department of Civil, Structural and Environmental Engineering had a stand at this event, where TRUSS ITN was represented by Rui Teixeira (ESR4), hosted by that same institution. Rui distributed TRUSS brochures to the attendants, explained the objectives of the project overall and his research on wind turbines in particular. With 175 presentations, activities and tours during the whole day, the event attracted more than one thousand visitors, from mostly second-level students and their parents/guardians, to mature students, teachers, guidance counsellors and punctual curious people.



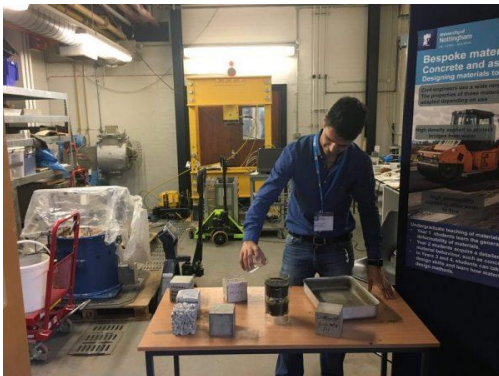
ESR4 Rui Teixeira at TCD open day (10/12/2016)

2.1.3 Open Day in UNOTT

UNOTT held Open Days on 30 June, 1 July and 15 September 2017. This a University event attended by thousands of students and their parents around the Campus, when they can talk to subject tutors about specific courses, meet current students, find out about what they would like to study and see all accommodation and award-winning facilities. Amongst them, hundreds visited the Faculty of Engineering where TRUSS ITN was represented by ESRs, Matteo Vagnoli and Federico Perrotta, hosted by that same institution. Federico and Matteo explained the objectives of the project and their research, ESR9 on fault diagnostic methods for bridges and ESR13 on impact of road conditions on fuel consumption and pavement life cycle assessment, to the attendants. Federico and Matteo also carried out hands-on practical demonstrations in front of visitors to show how civil engineering materials are built to meet design specifications.



Matteo Vagnoli at Open Day at UNOTT (30/06/2017 and 01/07/2017)



Federico Perrotta preparing setup of pavement samples in Open Day at UNOTT (30/06/2017 and 01/07/2017)



Attendants to Civil Engineering labs in Open Day at UNOTT

2.2 RESEARCH EXHIBITIONS

TRUSS ITN hosted stands at national exhibitions and career fairs. Posters about TRUSS ITN have been produced for display throughout the day, as well as some of the technology platforms to support this research. In these events, TRUSS ESRs have had opportunities for networking and meeting with the general public, individual researchers and with other industry representatives. Three activities were performed as listed below:

- UCD Earth Institute Research Exhibition in Dublin (Poster exhibition)
- TRUSS at engineering research showcase in Nottingham, UK.
- TRUSS at TRA visions 2017 in Vienna, Austria.
- Outreach at EUCYS 2018 held from 14-19 Sep 2018 in Dublin and supported by ESR1 Sofia Antonopoulou and ESR14 Siyuan Chen.

2.2.1 Research exhibition in UCD

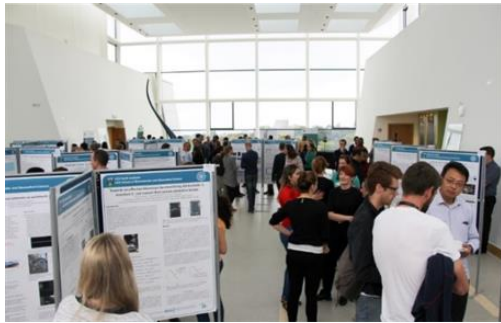
TRUSS fellows attended and presented posters from their projects in the exhibition organised by the UCD Earth Institute on 30th September 2015, to showcase the quality and breadth of research being undertaken within the Institute. In the photos, ESRs stand beside their posters to address queries by the attendants.



Siyuan Chen at Earth Institute (30/10/2015)



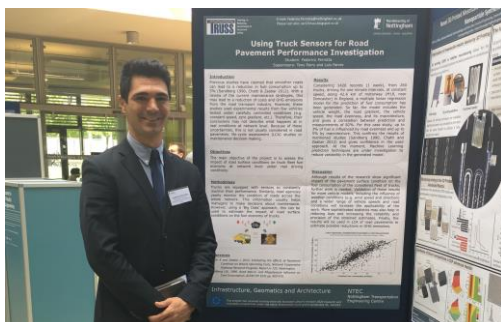
Sofia Antonopoulou at Earth Institute (30/10/2015)



Posters in research exhibition at Earth Institute

2.2.2 Research exhibition in UNOTT

The University of Nottingham's 2017 annual Engineering Research Showcase was held on 4 May in the Engineering and Science Learning Centre (ESLC). A full day of events, starting from 10am, was attended by about 150 people, mostly students and staff at the Faculty of Engineering. It consisted of posters, workshops and a keynote lecture by Alan Simpson, Shadow Chancellor's advisor on Sustainable Economics. TRUSS ITN was represented by Federico Perrotta (ESR13), who was shortlisted with up to 40 postgraduate research students (MRes, MPhil, Doctoral students) and level 4 research-only staff, to present their posters. The showcase was open to all and Federico spent the day sharing his research with a wider audience, including members of the public. It was a great opportunity to gain confidence in communicating his research, in developing effective communication and presentation skills, and to network with other researchers and build his profile.



Federico Perrotta at Research exhibition (04/05/2017)



Research Exhibition Showcase at UNOTT

2.2.3 Research exhibition in TRA Visions 2018

TRA VISIONS 2018 Young Researchers competition is the largest competition for Young Researchers in Europe for the transport industry and takes place every two years. The best final year and PhD students in Europe compete with each other. This year's winners were selected out of 169 young researchers from 56 different European universities that submitted 122 ideas for the transport modes road, rail, waterborne and cross-modal. The shortlisting event took place at the European Commission's DG Research in Brussels, Belgium on 15 February, when three winners were chosen per mode (road, rail, waterborne and multi-modal) for the Young Researcher competition. The winners were all invited to the Transport Research Arena (TRA) from 16-19 April 2018, with more than 3,600 participants, in Vienna, Austria, where €10,000 were awarded in prizes per mode sponsored by industrial partners. Federico Perrotta (ESR13) was one of this year's top 3 winners, and was invited to participate in the prestigious award ceremony (picture below) that took place during the 2018 TRA conference in Vienna, Austria, on the 16 of April all expenses paid.

Federico's proposal was exhibited inside the TRAVISIONS 2018 booth inside TRA. A poster displayed the idea developed by Federico in TRUSS. Federico, together with the other winners, were asked to spend some time (mainly during coffee breaks and lunches) at the TRAVISIONS booth in order to explain their vision to the visitors. These ideas are included in the TRAVISIONS book that was widely disseminated.



Federico Perrotta is congratulated by European Commissioner for Transport, Violeta Bulc (16/04/2018)



Federico Perrotta (3rd from the left) at TRAVISIONS booth

2.2.4 EU contest for young scientists

Sofia Antonopoulou (ESR1) and Siyuan Chen (ESR14) supported the Communication Office of DG Research & Innovation at their Horizon 2020 stand in the EU Contest for Young Scientists (EUCYS) 2018 on the Sunday 16 September session, held in RDS, Merrion Road, Ballsbridge, Dublin (Ireland). This was an event open to the public, which allowed the stand to be visited by EUCYS attendees, composed by their contestants, aged 14-20, as well as other visitors and schools. Siyuan covered the morning shift (:30 am to 1:30 pm) and Sofia did the afternoon (1:30 pm to 5:30 pm). There were only 10 places available to MSCA fellows, and given the high reply rate, the DG Communication Office had to select those ESRs to be present at the EU stand. This selection aimed to have as many projects as possible to give EUCYS contestants the possibility of discovering more fields of research.

This is the 30th edition of EUCYS, which attracted a total of 139 contestants from 38 countries (mostly from EU, but also non-EU such as China, Canada and Israel). The opening ceremony was addressed by Irish President Michael Higgins on the 15th September. During EUCYS, Sofia and Siyuan welcomed the interested contestants and visitors at the EU stand, sharing their experience with them, and promoting the possibility of a career in research. For this purpose, Sofia and Siyuan distributed brochures and books among attendees, and presented their projects in a didactic way using audio-visual material (videos showing how Braided Fiber Reinforced Polymers -BFRP- are designed and built for application in the construction industry, how drones are able to carry out a 3D reconstruction of a structure via capture of images while flying around it, and also videos about other projects in TRUSS ITN) and small objects (BFRP where students could test the high strength to weight ratio of this novel material) to tell about their research project, their research career, how EU (and the MSCA scheme in particular) helped them to move on with their professional objectives, and how EU invests in R&I through them. It is expected that the presence of Sofia and Siyuan will have served as inspiration for the future career of many EUCYS contestants.



Sofia Antonopoulou at EUCYS (16/09/2018)



Siyuan Chen at EUCYS (16/09/2018)

2.3 TALKS IN UNIVERSITIES AND COMPANIES

Universities in TRUSS ITN organise talks to students in their final year by potential industry employers, and by current lecturers and postgraduates on the possibility of choosing a research career. TRUSS ESRs report to these students on their personal and professional experience. Five activities were performed as shown below:

- Orientation presentation at School of Civil Engineering for new students to University, UCD, Dublin (Ireland), by Siyuan Chen (ESR14) on 07/09/2016.
- Talk about building your own drone, delivered by Siyuan Chen (ESR14) to 20 UCD graduate students within drone workshop on 29/09/2016.
- UPC Doctoral School: Information to Master students on Ph.D. programs at UPC, held on 08/06/17, and supported by ESR10 JJ Moughty and ESR11 Antonio Barrias. More than 110 graduate students attended. This is a University event where ESRs had an opportunity to speak individually with academic staff about graduate programmes (including research programmes).
- Talk about being a TRUSS researcher to Master students held on 8/11/2017 in Mieres, University of Oviedo (Spain), delivered by Arturo González, PC.
- Talks by ESRs on their research to full-time researchers and professionals in Universities and companies.

Some of these talks are described more in detail next.

2.3.1 Talks in UCD

Orientation events are organised to help all new students settle into life at UCD. These events run from 3 to 7 September and are designed to help students find their way in UCD. Two of the most important things to do during Orientation Week are to say 'Hello' to other new students and to get involved in as many activities as you can. For this purpose, Siyuan Chen

(ESR14) participated in a 2 hr activity where he delivered a presentation on 7 September 2016.

Unmanned Aerial Vehicles (UAVs) or drones developed rapidly recently and drawn attentions from mass public. To help students get a close contact with drone technologies, Dr Eleni Mangina arranged a workshop on 29 September 2016 for graduate students. PhD student Even O'Keeffe and Siyuan Chen (ESR14) made presentations during the workshop that was attended by 20 students. In the beginning, Dr Eleni Mangina introduced the history and current applications of UAVs. After that, Even O'Keeffe explained the legal requirement for UAVs application in Ireland. He also shared his experience in drone-related software developing. Then, Siyuan showed students the steps of building a DIY drone. Introduction to each component and tips for model selection were also provided. At the end of the session, students got a chance to have a close look at different drones and ask questions.



Participants in drone showcase by Siyuan Chen (29/09/2016)

2.3.2 Talk in UPC

The Open Day at the doctoral school in UPC is an activity mainly attended by masters students where Antonio Barrias (ESR11) and JJ Moughty (ESR10) talked about their PhD program experience. The aim was to clarify the pros and cons of a PhD, and entice possible students who would like to follow this path after the conclusion of their masters programs. The talks took place on the 8 of June between 11 am and 1 pm at the Sala d'Actes of Vertex building of UPC. In the first hour, there were different presentations including Antonio's presentation and another from another PhD student from the architecture department where they talked about their PhD experience. In the second hour, both Antonio and JJ answered questions from students in the Civil Engineering field who had some questions regarding TRUSS ITN PhD programs. There were at least 40 to 50 persons attending this event.



Antonio Barrias talking about his experience in TRUSS to UPC students (08/06/2017)



From left to right: Antonio Barrias, Joan Ramon Casas and John Moughty (08/06/2017)

2.3.3 Talk in University of Oviedo

On 8 November 2017, the Masters in Civil Engineering at Escuela Politecnica de Mieres (University of Oviedo, Spain), hosted a series of presentations, composed mostly of research projects by students in their last year, as requisite for their Master degree. The event, titled "I Jornadas de Investigacion, Desarrollo e Innovacion en Ingenieria Civil" (JIDIIC2017), was formally launched by the Vice-dean for research in University of Oviedo, José Ramón Obeso, and chaired by Mario Lopez, Luis A. Sañudo, Antonio Navarro and Pedro Plasencia. It consisted of a poster exhibition and 16 presentations about 15 minutes each, divided in four thematic areas: Structures and Geotechnics, Construction and Civil Works, Simulation and Testing, and Innovative Projects, running from 9.30 am to 2.45 pm. All presentations were delivered in Spanish, and attended by a group of about 50 Master students and academic staff. During the event, TRUSS had the chance to do a communication in a consortium language different from English, when the coordinator, Arturo Gonzalez, was invited to give a talk in Spanish about all aspects of being involved in a Marie Skłodowska-Curie Action. Students in the audience recognized a former colleague of theirs during their Bachelor degree at Mieres, Daniel Martinez (ESR12), who was featured in the slides of the presentation. At the end of the talk, the audience showed an interest on how to apply for a position as Early Stage Researcher within a Marie Skłodowska-Curie Action in the future, and they queried about the application requirements in TRUSS and what was needed for a successful application.

Surely, Daniel served as encouragement for some of his college comrades to pursue doctoral studies.



Arturo Gonzalez presenting TRUSS at University of Oviedo (08/11/2017)



Participants in JIDIIC2017 at University of Oviedo (08/11/2017)

2.3.4 Other talks in Universities and Companies

There was a group of talks targeting professionals and full-time researchers in the companies and University where ESRs were based, i.e.:

- Presentation on non-destructive testing of concrete delivered by Shar Nur Sourav (ESR2) to Arup staff at their quarters in Dublin, Ireland on 21 June 2016.
- Presentations on unmanned aerial vehicles technology delivered by Siyuan Chen (ESR14) to Arup staff at their quarters in Dublin, Ireland on 19 April and 31 July 2016.
- Talk about the TRUSS project delivered by Matteo Vagnoli (ESR11) to University of Nottingham academics and student on 9 October 2016. He explained the goals, partners, beneficiaries and research program of TRUSS in addition to the goals of his individual research project by showing a case study investigated in the first year.



Matteo Vagnoli presenting his work at TRUSS to University of Nottingham postgrads and staff (9/10/2016)

- Presentation of project results by Federico Perrotta (ESR13) to TRL staff at their quarters at Crowthorne, Wokingham, UK, on 30 March 2017.



Federico Perrotta presenting his work to TRL staff (30/03/2017)

- Presentation and discussions at PhD Day 2017 at TRL on 19 July 2017. This event brought together 11 PhD students and 2 supervisors that collaborate with TRL in their projects, giving them the opportunity to meet, and share their experience and ideas. This was the first edition of the event and Federico Perrotta (ESR13) was part of it, having the possibility to introduce his research and experience to other PhD students.



Federico Perrotta (kneeling) in TRL PhD day (19/07/2017)

- Research presentations to postgrads and academic staff in UCD. Barbara Heitner (ESR8), Farhad Huseynov (ESR7), Alberto Gonzalez (ESR3), Daniel Martinez (ESR12), Sofia Antonopoulou (ESR1), Giulia Milana (ESR6), Shah Nur Sourav (ESR2) and Guang Zou (ESR5) carried out formal public presentation on the 6 and 7 February, 9 and 16 May, 14 and 15 June, 27 July and 27 October 2017 respectively, to other researchers and staff members to meet the requirements of PhD transfer from Stage 1 to Stage 2 in UCD. Similar presentations were carried out by ESRs registered to a PhD in other Universities of the consortium.



Barbara Heitner (06/02/2017)



Alberto Gonzalez (09/04/2017)



Shah Nur Sourav (27/07/2017)

2.4 ACTIVITIES AND TALKS TARGETTING SCHOOL STUDENTS

ESRs have visited 1st, 2nd and high-level education schools to talk about TRUSS ITN and engineering as a career. A total of 6 School talks or activities were delivered within TRUSS as listed below:

- Talk on career choices, engineering and TRUSS as an example of the project that Ph.D. students work on, at Saint Joseph's College, Garbally Park, Galway (Ireland) held on 12/03/15, supported by Eugene OBrien, and reached by 30 boy students aged 18 years old (2nd level School).
- "Free-standing structure challenge I" in Ireland Science Week 2015, helping children at Willow School, Dublin (Ireland), in the construction of a building made spaghetti to promote TRUSS and engineering held on 10/11/15. ESR1, ESR4, ESR12, ESR14, Project Manager, and Aoife Ahern (UCD) supported the event and was reached by one hundred 9-years-old boys (Junior School).
- "Free-standing structure challenge II" in Ireland Science Week 2016, held in Willow School, on 15/11/16 and supported by ESR5, ESR6, ESR7, ESR8, Project Manager, Aoife Ahern. It was reached by one hundred 9-years-old boys (Junior School).
- Presentation on Mount Anville Montessori Junior School, Dublin, Ireland about girls in engineering held on 13/02/17 and supported by ESR1 (Sofia Antonopoulou) and ESR6 (Guilia Milana). It was reached by two hundred and fifty girls aged 7 to 12 years.
- Wooden Bridge Challenge held in UCD on 27/07/2017 supported by ESR12 Daniel Martinez and attended by 22 students from the USA.
- "Free-standing structure challenge III" in Ireland Science Week 2017, again held at Willow School on 13/11/17 and supported by ESR2, ESR10, ESR12, ESR14, Aoife Ahern, John O'Sullivan and Patrick Purcell (UCD

academie staff) and TRUSS project manager. It was reached by one hundred and twelve 9-years-old boys.

- Presentation of TRUSS project at Escuela Oficial Idiomas (EOI – Language School), Torrelavega (Cantabria, Spain) held on 29/11/17 and supported by ESR3 (Alberto Gonzalez).

2.3.1 Talks and Activities for High School students

Professor Eugene OBrien of University College Dublin (centre) is pictured with Careers Guidance Counsellor Roisin McSharry and Engineering teacher Paul Walsh in the photo below. The talk was attended by a class of about 30 boys – approximately 18 years old – in the final year of 2nd level school at Saint Joseph's College. Prof. O'Brien talked to them about career choices, about Engineering in general, about life in university and about post-graduate study. He outlined the TRUSS project as an example of the kind of project that PhD students work on, including the scientific objectives, the partnership and the travel opportunities.



Eugene OBrien (centre) with Roisin McSharry and Paul Walsh at St. Joseph's College (12/03/2015)

Daniel Martinez (ESR12) and Loreto Manriquez (TRUSS PM) participated in an outreach activity hosted by UCD Civil Engineering School at 10.30 am on the 27 July 2017. The activity is part of a series of interactive workshops within the UCD High School Summer Program, that was managed by the postdoc researcher Abdollah Malekjafarian, who has collaborated in many of Daniel's papers. It also counted with the collaboration of Charlie O'Donohue (UCD Summer High School Programme) and the following UCD postgraduate researchers: Peter McDonnell, Hamid Gharibi, Ehsan Moradabadi and Laura Egan-O'Brien. The interactive engineering practical workshop organised by the Civil Engineering School was titled "structural engineering challenge" and it attracted 22 students from USA. The participants were divided into 5 teams of 4 or 5 members each. The objective of each team was to design and construct an efficient scaled beam structure, from a limited supply of materials, to carry the highest load possible over a given span. The best structure had to make ingenious use of balsa wood to carry compressive loads and string to carry tensile loads. These concepts were first explained by Abdollah prior to the design and construction phases, and reinforced by the demonstrators while helping the teams. Once the structures were built, they were then loaded until collapse. The winning structure was the one achieving the highest ratio of mass carried to the mass of the structure itself (self-weight). During the two and a half hours of duration of the activity, Daniel (ESR12) played a demonstration role. He used the expertise

gained with his TRUSS research on bridges, to advise students about those structural forms best suited to bring the load from their point of application to the supports, and to help them optimizing the amount of material used in the structure to carry out this task with minimum cost.

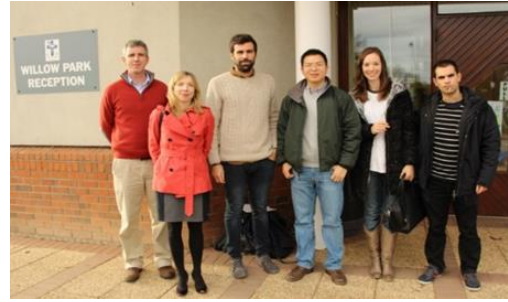


Daniel Martinez and Abdollah Malekjafarian (27/07/2017)

2.3.2 Talks and Activities for Junior School students

Science Week Ireland is an annual event dating back to 1996 that has grown into a programme of over 800 events scheduled across Ireland. The purpose is to make science more interesting and accessible to children and adults alike. It highlights how science, technology and engineering are hugely relevant to us all in our everyday lives, lead to interesting and exciting career options and develop creativity in our children (source: www.science.ie). While Science Foundation Ireland provides support through coordination of all events on a national level, event organisers (including universities, institutes of technology, libraries, schools, community groups and industry) volunteer to organise an event within the local area.

TRUSS participation in Willow Science Week 2015 (9 to 12 November) served the purpose of inspiring school children and motivating them to pursue an engineering career. In particular, the fellows Sofia Antonopoulou (ESR1), Rui Teixeira (ESR4), Daniel Martinez Otero (ESR12) and Siyuan Chen (ERS14), and the project manager, Loreto Manriquez, assisted in the organisation of the activity “Free-standing Structure Challenge” held in Willow Park Junior School, Dublin, on 10 November. The activity was led by Dr. Aoife Ahern, Dr. John O’Sullivan and Dr Patrick J. Purcell from UCD School of Civil Engineering. It gathered more than 100 children at the School’s Gym and it ran from 11.30 am to 1 pm. There were four 4th-form classes (about 9 years old), divided into six groups of about four boys each, i.e., a total of 24 groups. Each TRUSS fellow was assigned 6 groups to provide support. The challenge consisted of building the tallest free-standing structure with 20 sticks of spaghetti, 1 m of masking tape, 1 m of string and 1 marshmallow. Building materials and tools were provided to all teams. The four members of the winning team were awarded TRUSS-UCD hoodies and there were TRUSS lollipops for all children.



From left to right: John O’Sullivan, Aoife Ahern, Rui Teixeira, Siyuan Chen, Sofia Antonopoulou and Daniel Martinez at Willow Park Junior School, Dublin (10/11/2015)



TRUSS in Science Week Ireland 2015

In 2016 Science week, TRUSS again organised an activity jointly with the UCD School of Civil Engineering and the Willow Park Junior School in Blackrock (Dublin) on the Tuesday 15 November 2016 from 11 am to 1 pm. The activity gave about one-hundred 9 years old boys the opportunity to participate in hands on building construction, discovering topics such as stability, equilibrium, forces, materials and many more. During the challenge, the teams received the support of John O’Sullivan and Patrick Purcell (academic staff from UCD School of Civil Engineering), Aoife Ahern (Head of UCD School of Civil Engineering), Loreto Manriquez (TRUSS project manager), and our TRUSS Early Stage Researchers: Shah Nur Alam Sourav (ESR2), Guang Zou (ESR5), Giulia Milana (ESR6), Farhad Huseynov (ESR7) and Barbara Heitner (ESR8). There were TRUSS sweets for all participants and TRUSS-UCD hoodies were awarded to the winning team.



UCD academic staff and ESRs (standing) give instructions to students (15/11/2016)



From left to right: John O'Sullivan, Shah Nur Sourav, Barbara Heitner, Guang Zou, Farhad Huseynov, Giulia Milana and PJ Purcell at Willow School (15/11/2016)

Sofia Antonopoulou (ESR1), Giulia Milana (ESR6) and Loreto Manriquez (TRUSS project manager) joined Dr. Aoife Ahern (UCD Head of Civil Engineering School) for an outreach activity in Mount Anville Montessori Junior School (Dublin, Ireland) on Monday 13 February 2017 from 8.45 am to 9.30 am. Mount Anville is a Sacred Heart Montessori Junior School for pupils from 2½ to 12 years, located in Mount Anville Road, Dublin 14. As part of the activity, Sofia and Giulia talked about their experience in civil engineering and in TRUSS to approximately 250 girls aged 7 to 12 years.

The speakers talked about the four main branches of Civil Engineering. While transport and water were covered by Dr. Ahern, structures and materials were presented by Giulia and Sofia respectively. Giulia told students how since she was small, she enjoyed playing with Lego and building structures. Sofia also referred to younger years when she felt attracted to nature, materials and their composition. Sofia brought a few samples of new reinforcing materials (Braided FRP) that the girls had the chance of handling. The audience showed great enthusiasm for our ESRs' work on ship unloaders and new materials for reinforcing buildings, which in their own words, they found to be "cool", and hopefully it will have helped towards a lifelong interest in engineering. There were plenty of questions such as "Is the ship unloader built or are you designing it?", "How do you test materials to verify they are strong enough?" or "Are the rebars that you are working with part of current buildings?". At the end of the session, all girls received TRUSS treats.



Aoife Ahern (UCD), Sofia Antonopoulou and Giulia Milana standing present in Mount Anville School (13/02/2017)



Sofia Antonopoulou and Giulia Milana (13/02/2017)

By the third consecutive year, TRUSS repeated participation in Science Week Ireland, at Willow Park Junior School in Blackrock (Dublin) on the 13 November 2017 from 9.30 am to 11.30 am. The activity targeted 112 nine-years old students in teams of four and five. During the challenge, the teams received the support of John O'Sullivan and Patrick Purcell (academic staff from UCD School of Civil Engineering), Aoife Ahern (Head of UCD School of Civil Engineering), Parisa Beizaei (TRUSS project manager), and our TRUSS Early Stage Researchers: Shah Nur Alam Sourav (ESR2), Daniel Martinez (ESR12), Siyuan Chen (ESR14) and JJ Moughty (ESR10) who supervised the teams randomly. The competition was very tight, and finally, there were two winners that reached the same height of 65 cm using two imaginative and efficient structural designs. At the end of the session, TRUSS-UCD hoodies and vouchers were awarded to the two winning teams, and TRUSS lollipops were distributed to all participants.



Shah Nur Sourav at Science Week 2017 (13/11/2017)



Siyuan Chen at Science Week 2017 (13/11/2017)



Daniel Martinez at Science Week 2017 (13/11/2017)

2.3.3 Talk in Language School

Alberto González Merino (ESR13) gave a 1 hour talk in the Escuela Oficial de Idiomas (EOI-Language School) of Torrelavega (Spain) on 29 November 2017. EOI is the official state-funded language school where Alberto has been enrolled. The School organised a speaking Open day consisting of multiple talks. The event was aimed to improve communication skills in English, but there Alberto had the chance to present the TRUSS project and his individual research, the Horizon 2020 and the overall Marie Curie Action. There were 25 attendees from different backgrounds and age groups making the audience very diverse, including from teenagers to old-age pensioners, students, lecturers and teachers. The audience asked about Fukushima, how nuclear plants and how many plants there are in Spain. They also asked about his view on nuclear energy and about radiations.



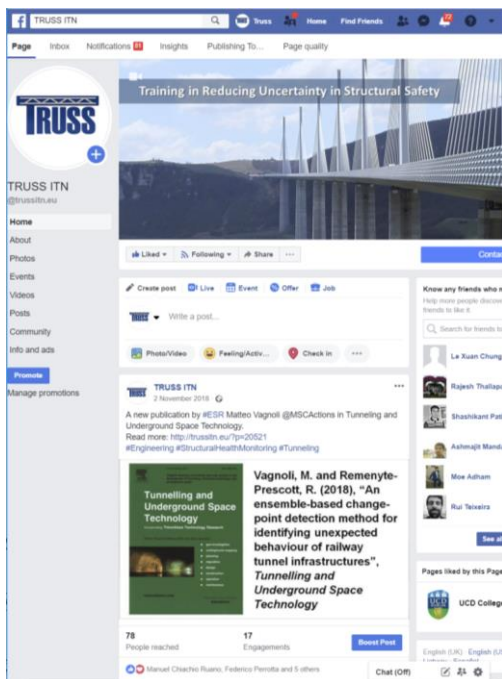
Presentations at School Language (29/11/2017)

Full details about outreach activities can be found on <http://trussitn.eu/page?p=11119>.

Chapter 3: Social media

3.1 FACEBOOK

TRUSS ITN Facebook is located at <https://www.facebook.com/trussitn.eu>. The figures in Facebook are 145 followers, 144 likes, 262 posts, 29,917 reach and 6,057 engagements. Facebook was the most successful social media profile in attracting visitors to the TRUSS website during the first three years of the project. 95 photos and 2 videos can be found in TRUSS Facebook.



TRUSS in Facebook

The most successful posts in Facebook are shown below.



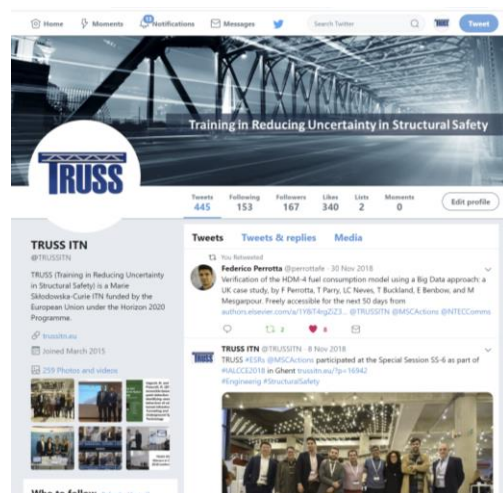
Facebook post with 2,193 reach; 448 post clicks; 154 reactions/comments/shares



Facebook with 1,173 reach; 253 post clicks; 188 reactions/comments/shares

3.2 TWITTER

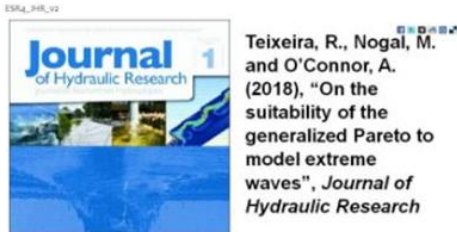
TRUSS Twitter is located at <https://twitter.com/TRUSSITN>. The figures in Twitter are 445 tweets, 167,292 impressions, 340 likes and 168 followers. Twitter profile was inaugurated in March 2015, and since then, 259 photos and videos have been posted. In the last year of the project, Twitter has been the social media profile attracting most visitors to the TRUSS website. Twitter analytics indicate that TRUSS is most popular amongst the following countries: UK (21%), Spain (11%), Ireland (11%), France (10%), Belgium (6%), Germany (4%), United States (4%), Italy (3%), Austria (3%) and Denmark (2%). 53% are male visitors and 47% are female visitors. 98% and 97% of the audience have an interest in Science news and Tech news respectively.



TRUSS in Twitter

Top Tweet earned 4,463 impressions

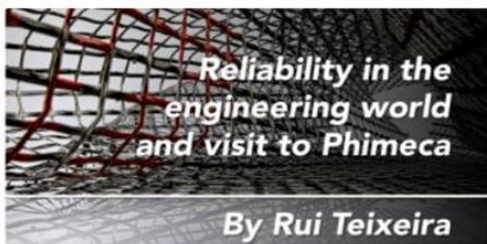
"On the suitability of the generalized Pareto to model **#extreme** waves" A paper by **#ESR** Rui Teixeira and his supervisors in the Journal of **#Hydraulic #Research** **@MSCActions** bit.ly/2vnEbmT pic.twitter.com/7plavNzYGV



Twitter post with 4,463 impressions

Top Tweet earned 3,562 impressions

Rui Teixeira writes about his experience **@_Phimeca**, **#statistical** know-how and **#reliability** in bit.ly/2zW0KkF **@MSCActions** pic.twitter.com/LebgZW7RAP



Twitter post with 3,562 impressions

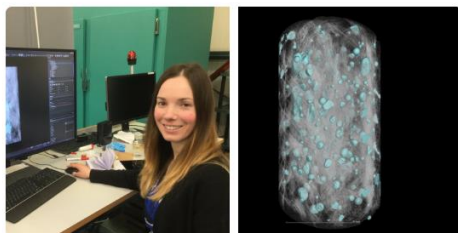
TRUSS is also found in other profiles. I.e., the top mention in January 2019 with 65 engagements, relating ESR1, is pictured below.

Top mention earned 65 engagements



UCD Rosemount
@_Rosemount · Jan 24

Quality evaluation of laboratory manufactured **#BFRP** composite **#rebars** for **#civilengineering** applications **@_Rosemount** **@SaoirseT**. Detection of voids & manufacturing defects on composite bars using **#microCT** and **#VGstudiomax**. **#structuralsafety** **#structuralcomposites**. **@TRUSSITN** pic.twitter.com/hKD0Su3Z04

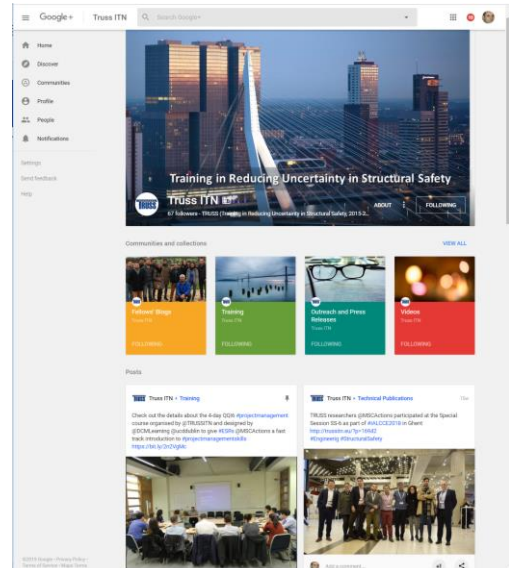


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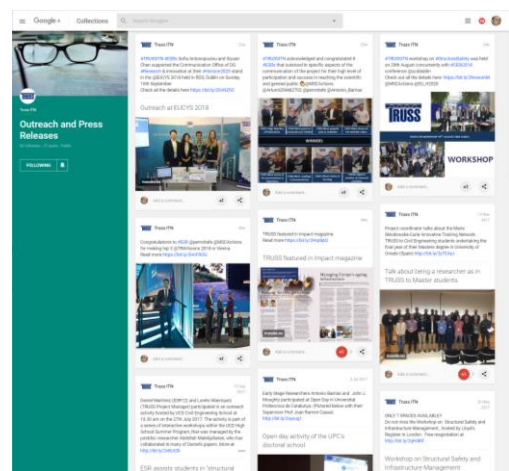
View Tweet

3.3 GOOGLE+

TRUSS Google+ is located at <https://plus.google.com/+TrussITN>. Contents are divided within 5 public collections: "Fellows' blogs" (69 followers and 144 posts), "Training" (70 followers and 29 posts), "Outreach and Press Releases" (82 followers and 27 posts), "Videos" (71 followers and 15 posts) and "Technical Publications" (80 followers and 12 posts).



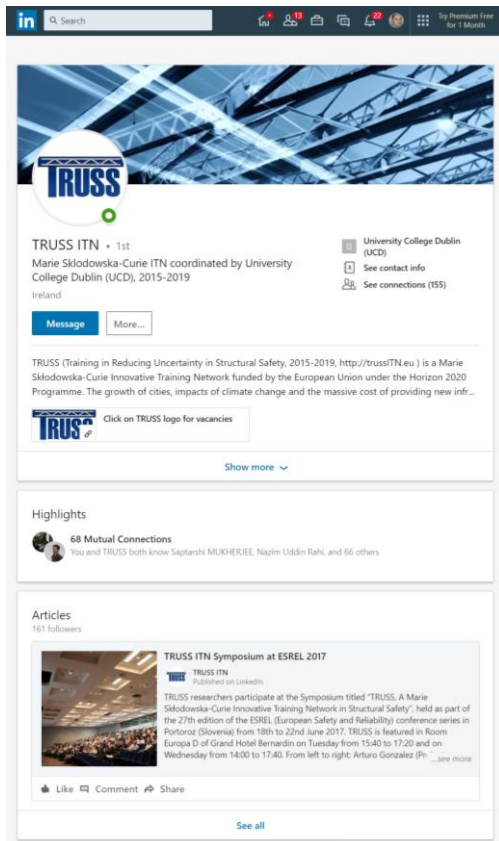
TRUSS in Google+



Outreach and Press Releases Collection in Google+

3.4 LINKEDIN

TRUSS has 161 followers in LinkedIn, located at <https://www.linkedin.com/in/trussitn/>. The 262 posts in Facebook were imported into LinkedIn. In addition to those posts, there are 35 LinkedIn articles.



TRUSS in LinkedIn

The following two pictures show the LinkedIn posts with a highest number of clicks.



LinkedIn post with 1,071 clicks

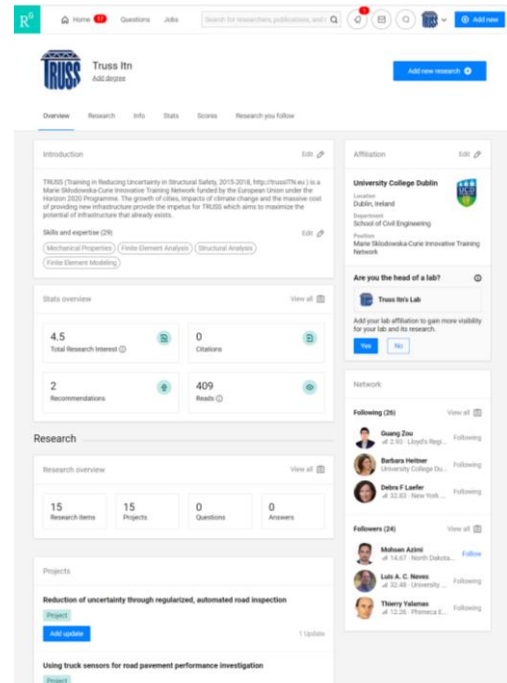


LinkedIn post with 425 clicks

3.5 RESEARCHGATE

TRUSS ResearchGate has 24 followers, 2 recommendations and 409 reads at www.researchgate.net/profile/Truss_Itn. The

profile is divided into 14 individual projects (one per ESR) associated with researchers, descriptions, papers, posters and presentations. The reads consist of 350 project reads, and 59 publication reads (33 full-text reads and 26 other reads). The total research interest is higher than 21% of researchers on ResearchGate.



TRUSS in ResearchGate

The table below shows the number of followers and reads per project in ResearchGate.

Followers and reads in ResearchGate

ESR	Followers	Reads
1	2	52
2	3	10
3	8	16
4	13	18
5	19	87
6	12	2,505
7	11	257
8	23	599
9	60	1,524
10	26	1,283
11	102	1,999
12	25	651
13	73	954
14	49	1,045
Total	426	11,000

3.6 BLOGGER

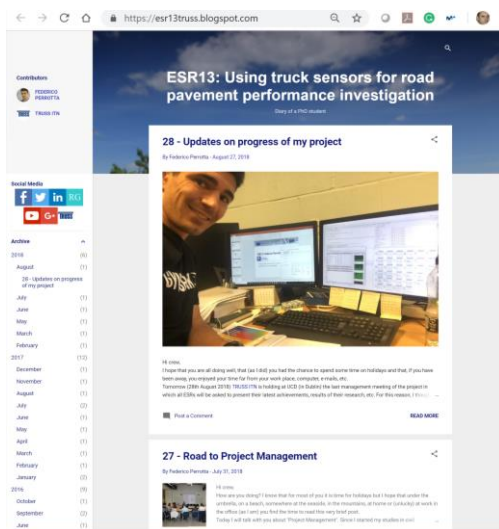
ESRs regularly maintained blogs in BlogSpot to inform of their current activities in a language that could be easily understood by the public. The blogs were accompanied by appropriate tags to ensure maximum exposure in internet searches. ESRs delivered 146 posts that were viewed 45,340

times. The following table summarizes the number of posts and views per blog.

Posts and views in Blogger

ESR	No. blog posts	Total page views
1	7	2,971
2	7	1,540
3	7	1,804
4	17	3,670
5	6	1,443
6	6	1,287
7	7	2,142
8	10	2,166
9	9	3,310
10	4	1,729
11	18	5,148
12	8	1,698
13	29	13,002
14	11	3,430
Total	146	45,340

The blog by ESR13, shown below, was the most active and popular with 13,002 views.



Blog by ESR13

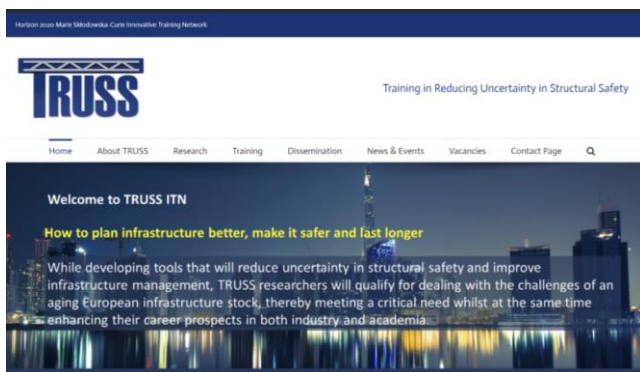
More info about TRUSS social media can be found on <http://trussitn.eu/page?p=15232>.

Chapter 4: Other communication channels

4.1 TRUSS WEBSITE

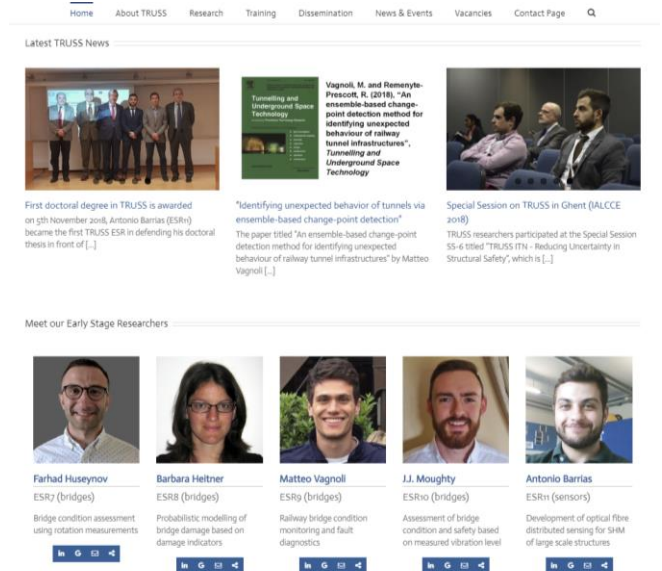
The website (<http://trussitn.eu>) probably has probably been the vehicle of greatest impact. There are currently 190 pages of content with information for the public/wider community about the project's aims, activities and material available (e.g. outreach in primary, secondary and high school education, material for stakeholders, etc.), as well as highlighting the technical work and dissemination results developed within TRUSS. There are also external links to ESR's blogs, to their publications made available in repositories, and to other websites containing info of interest.

The website was launched and available to the public on 24 February 2015. It is fully responsive for viewing from mobile devices, and complies with the Accessibility standard W3C WCAG (AA standard). Updating and maintenance of the website was undertaken by the TRUSS management team with technical support from UCD IT Support Services. Hits to the website are monitored using google analytics. The homepage is divided into 7 main levels: /About TRUSS/, /Research/, /Training/, /Dissemination/, /News & Events/, /Vacancies/ and /Contact Page/, which can be accessed from an upper horizontal menu.



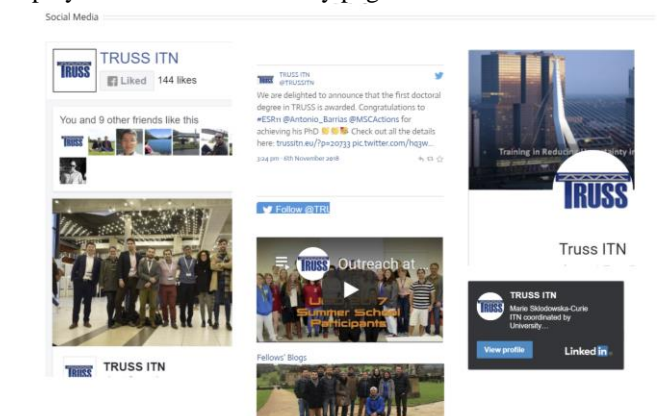
Top of homepage

The middle of the homepage has two sub-sections: One showing the most recent news, and a rotational plugin allowing to access the profiles of the 14 ESRs. A total of 82 news items were posted.



Middle of homepage

At the bottom of the homepage, it is possible to access TRUSS social media. Social media include Facebook, Twitter, LinkedIn, Google+, ResearchGate, SlideShare, YouTube, easily accessed through the footer of the site or the /Dissemination/ level for online engagement. The Commission logo and acknowledgment to the Commission is displayed in the footer of every page.



Bottom of homepage

The most visited pages in the website are the homepage with 25003 views (23.08%), followed by the first level pages introducing /vacancies/, /research/, /news-events/, /dissemination/ and /training/ with 11329 (10.46%), 4006 (3.70%), 3292 (3.04%), 2783 (2.57%), 2541 (2.35%) and 2081 (1.92%) views respectively.

Under /About TRUSS/, there are a homepage and 4 sub-levels:

- /About TRUSS/Objectives/
- /About TRUSS/Structure/
- /About TRUSS/Consortium/
- /About TRUSS/People/

In this section, all companies/institutions with a main involvement in the project are listed including company's logo, a brief description on facilities, links to the company home page and also a brief introduction to the people from that company involved in the project (with contact details and links to personal home pages if any). There are also links to profiles for all people involved in the project and external links to the Cordis website.

Under /Research/, there are a homepage and 2 sub-levels:

- /Buildings, Energy and Marine Infrastructure/
- /Rail and Road Infrastructure/

,which give access to each of the individual research projects for each ESR, with details on background, objectives, expected results, secondments and people involved. TRUSS research outputs (publications, public reports, and presentations) can be accessed here or under the /Dissemination/ level.

Under /Training/ there are a homepage and 3 sub-levels:

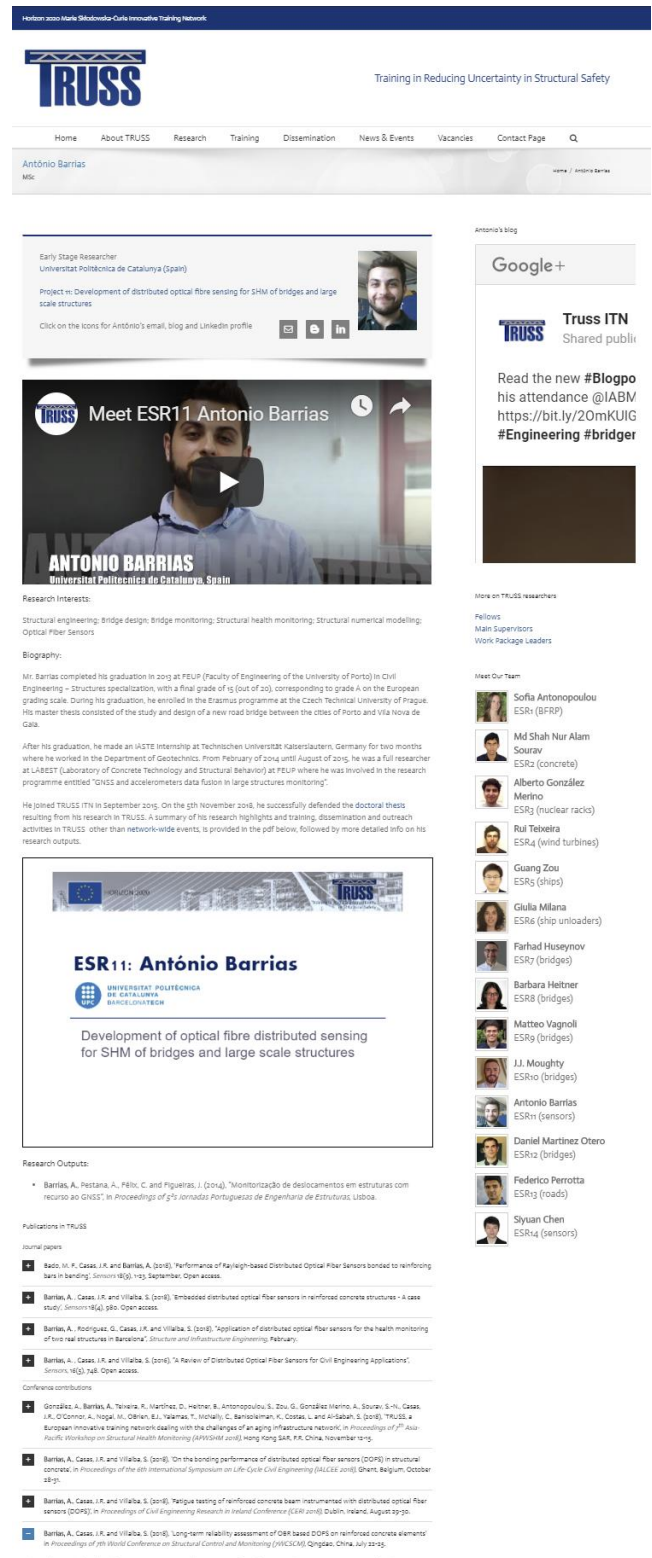
- /Network-wide/
- /Local/
- /Supervision/

describing in detail the training activities under each category. Under /Dissemination/, there are a homepage and 6 sub-levels:

- /Dissemination/
- /Publications/
- /Outreach/
- /Blogs and Social Media/
- /Workshops/
- /Conferences/
- /Other Communications/

There is a section dedicated to all publications from the project, where draft copies of papers are made available when allowed by the publishers (directly in the TRUSS website or linked to the institutional repositories of the partners).

The dynamic plug showing all ESRs in the homepage is linked to their profile webpage. A example of profile webpage is shown in the next figure. From their profile pages, it is possible to access a video where they introduce themselves, their LinkedIn profile, research blog, email, a short bio, publications (including abstracts and links to repositories), presentations, and to find out more about their project, host and supervisors.



The screenshot displays the TRUSS website interface. At the top, there's a navigation bar with links: Home, About TRUSS, Research, Training, Dissemination, News & Events, Vacancies, Contact Page, and a search icon. Below this, the main header area features the TRUSS logo and the tagline 'Training in Reducing Uncertainty in Structural Safety'. The profile of António Barrias is highlighted, showing his role as an Early Stage Researcher at Universitat Politècnica de Catalunya (Spain). A video player is embedded, showing António Barrias introducing himself. To the right, there's a Google+ widget and a list of TRUSS researchers, including Sofia Antonopoulou, Mid Shah Nur Alam, Sourav, Alberto González Merino, Rui Teixeira, Guang Zou, Giulia Milana, Farhad Huseynov, Barbara Heitner, Matteo Vagnoli, J.J. Moughy, Antonio Barrias, Daniel Martínez Otero, Federico Perrotta, and Shiyuan Chen. The profile also lists research interests, a biography, research outputs, and publications.

Example of ESR profile

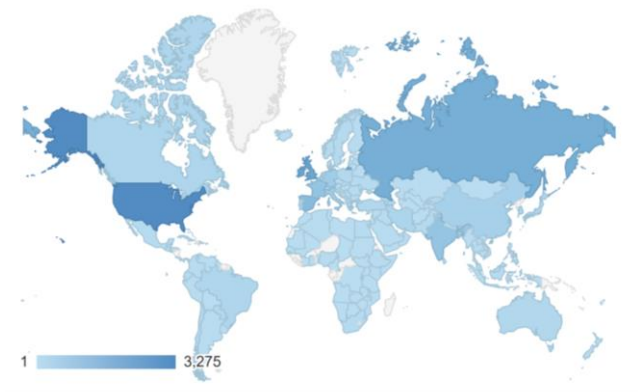
During the period January 2015 to December 2018, the figures of the website were as follows: 22,424 users (22,358 new users, i.e., 10.3% were returning visitors and 89.7% were new visitors), 38,495 sessions (i.e., 1.72 sessions per user), 108,343 page views (i.e., 2.81 pages/session), average session duration of 2 minutes and 57 seconds, and bounce rate of 59.4%. had been visited by more than 22,116 new users with 38,144 sessions averaging 2.81 pages per session and 3

minutes per session. Based on a sample of 8,208 users, 62.40% reached TRUSS website via an organic search, 25.36% via a direct search, 8.46% through referral and 3.76% from social media. The following table shows where social traffic originates and the networks where people engaged with TRUSS content. Facebook and Twitter outperformed other social channels.

Acquisition via social media

Social Network	Sessions	Page Views	Avg. Session Duration	Pages/ Session
Facebook	1,782	4,541	00:02:58	2.55
Twitter	977	5,477	00:08:07	5.61
Google+	558	3,002	00:08:01	5.38
LinkedIn	553	2,042	00:04:06	3.69
Blogger	425	1,118	00:02:13	2.63
Research Gate	133	491	00:05:57	3.69
Reddit	33	65	00:05:15	1.97
YouTube	30	106	00:05:59	3.53

Regarding demographics, the figure below shows a world map with the countries having more sessions in TRUSS website in a darker colour.



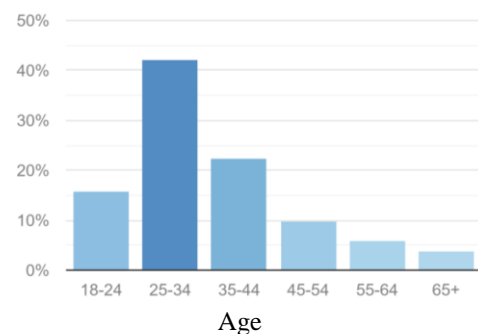
TRUSS user world map

Figure below gives details for the top visiting countries such as number of sessions and users.

Country	Users	New Users	Sessions
	22,424 % of Total: 100.00% (22,424)	22,358 % of Total: 100.00% (22,358)	38,495 % of Total: 100.00% (38,495)
1. United States	3,275 (14.48%)	3,251 (14.54%)	3,478 (9.03%)
2. Ireland	2,157 (9.53%)	2,137 (9.56%)	7,918 (20.57%)
3. United Kingdom	2,154 (9.52%)	2,134 (9.54%)	3,869 (10.05%)
4. Russia	1,846 (8.16%)	1,845 (8.25%)	2,487 (6.46%)
5. Spain	1,332 (5.89%)	1,310 (5.86%)	3,371 (8.76%)
6. (not set)	1,088 (4.81%)	1,085 (4.85%)	1,099 (2.85%)
7. France	975 (4.31%)	964 (4.31%)	1,551 (4.03%)
8. India	952 (4.21%)	953 (4.26%)	1,506 (3.91%)
9. Italy	696 (3.08%)	673 (3.01%)	1,160 (3.01%)
10. Germany	620 (2.74%)	613 (2.74%)	814 (2.11%)

Top visiting countries to the website

The age graph below is based on 9.25% of total users. Visitors are dominated by an age group between 25 and 34 years. Based on 9.30% of total users, 40.1% are female and 59.9% are male.



4.2 OTHER WEBSITES

Other websites with info about TRUSS include:

- Cordis at <https://cordis.europa.eu/project/rcn/193916/factsheet/en>
- OpenAire at https://explore.openaire.eu/search/project?projectId=corda_h2020::f3335f421bc76c18479edac18a9f7a8b)
- UCD repository at <https://researchrepository.ucd.ie/handle/10197/7935>

CORDIS
Community Research and Development Information Service

European Commission - CORDIS - Projects and Results - Training in Reducing Uncertainty in Structural Safety

TRUSS
Project ID: 642453
Funded under:
H2020-SU-1-3.1 - Fostering new skills by means of excellent initial training of researchers

Training in Reducing Uncertainty in Structural Safety
From 2015-01-01 to 2018-12-31, ongoing project | [TRUSS Website](#)

Project details

Total cost: EUR 3 701 306,68	Topic(s): MSCA-ITN-2014-ETN - Marie Skłodowska-Curie Innovative Training Networks (ITN-ETN)
EU contribution: EUR 3 701 306,68	Call for proposal: H2020-MSCA-ITN-2014
Coordinated in: Ireland	Funding scheme: MSCA-ITN-ETN - European Training Networks

Objective

The growth of cities, impacts of climate change and the massive cost of providing new infrastructure provide the impetus for this proposal - entitled Training in Reducing Uncertainty in Structural Safety (TRUSS) - which will maximize the potential of infrastructure that already exists. If flaws in a structure can be identified early, the cost of repair will be vastly reduced, and here an effective monitoring system would allow identifying the optimum time to repair as well as...

Deliverables

Websites, patent filings, videos etc. (1)

Publications

Conference proceeding (21)

Development of Braided Basalt FRP Rebar for Reinforcement of Concrete Structures
Author(s): Antonopoulos, Sofia ; McSherry, Clavin ; Byrne, Dáire
Published on: Proceedings of the 8th International Conference on Fibre Reinforced Polymer (FRP) Composites in Civil Engineering (ICCE 2016), Hong Kong, China, 14-16 December 2016, 2016.

Monitoring the Condition of a Bridge using a Traffic Speed Deflectometer Vehicle Travelling at Highway Speed
Author(s): O'Brien, Eugene J.; Savitskiy, Evgeniy; Martinez, Daniel
Published on: Proceedings of ICE 3rd International Balkan Conference on Challenges of Civil Engineering, Boka University, Tuzla, Bosnia, 19-21 May 2016, 2016.

Sources of structural failure in ship unloaders
Author(s): GONZALEZ, Arturo; Baranowski, Piotr; Hsiao, Tzong
Published on: 26th European Safety and Reliability Conference (ESREL 2016), Glasgow, UK, 25-29 September 2016, week 2, 2016.

Dynamic analysis of the nonlinear response of high density fuel storage racks
Author(s): Gonzalez-Marino, Alberto; Costas de la Peña, Luis; Gonzalez, Arturo
Published on: Proceedings of Civil Engineering Research in Ireland (SERI 2016), Galway, Ireland, 29-30 August 2016, 2016.

Cordis

The metrics in OpenAire indicate 536 downloads.

OpenAire

TRUSS

Title: Training in Reducing Uncertainty in Structural Safety
Funding: EC | H2020 | MSCA-ITN-ETN
Call: H2020-MSCA-ITN-2014
Contract (GA) number: 642453
Start Date: 2015/01/01
End Date: 2018/12/31
Open Access mandate: yes
Data Plan: no
Organizations: ENSA, Lloyd's Register EMEA, TCD, Arup Consulting Engineers, FULL SCALE DYNAMICS LTD, UPC, PHIMECA, NUI DCD, UNOTT
More information: [Detailed project information \(CORDIS\)](#)

Publications (55) **Research Data (0)** **Statistics**

Dynamic analysis of the nonlinear response of high density fuel storage racks
Gonzalez Marino, Alberto; Costas de la Peña, Luis; Gonzalez, Arturo (2016)
Projects: EC | TRUSS (642453)
High Density Spent Fuel Storage racks are steel structures designed to hold nuclear spent fuel assemblies removed from the nuclear power reactor. Weighing around 80 tons, they are 5m high free-standing structures resting on the floor of a 12m depth pool and separated by only a few centimetres. Their underwater seismic response is a troubling safety issue, especially after Fukushima nuclear disaster. However, only limited basic guidelines have been provided as regulatory design criteria to date...

Vibration based damage detection techniques for small to medium span bridges: a review and case study
Moughy, John James; Casas Ruiz, Joan Ramon (2016)
Projects: EC | TRUSS (642453)
Overtime, the structural condition of bridges tends to decline due to a number of degradation processes, such as creep, corrosion and cyclic loading, among others. Considerable research has been conducted over the years to assess and monitor the rate of such degradation with the aim of reducing structural uncertainty. Traditionally, vibration-based damage detection techniques in bridges have focused on monitoring changes to modal parameters and subsequently comparing them to numerical models...

OpenAire

TRUSS repository in UCD have had 1,302 page views (1,249 of which are from Europe) and 8,011 item downloads as follows: 2935 from Europe (548 - Ireland, 354 - UK, 337 - Germany, 267 - France, ...), 2833 from Asia (520 - India, 503 - China, 318 - Iran, 236 - Indonesia, 203 - Turkey), 1646 from North America (1501 - United States), 272 from Africa, 167 from South America and 158 from Oceania. These

numbers do not include downloads at the repositories of other beneficiaries such as the research repository of Catalonia (UPC), Nottingham ePrints (UNOTT) or Tara (TCD).

RESEARCH REPOSITORY UCD

Welcome to Research Repository UCD

Research Repository UCD is a digital collection of open access scholarly research publications from University College Dublin. Research Repository UCD collects, preserves and makes freely available publications including peer-reviewed articles, working papers and conference papers created by UCD researchers. Where material has already been published it is made available subject to the open-access policies of the original publishers. This service is maintained by UCD Library.

Research Repository UCD / Institutes and Centres / Training in Reducing Uncertainty in Structural Safety Innovative Training Network (TRUSS-ITN) "TRUSS-ITN Research Collection"

TRUSS-ITN Research Collection : [52 items]

Collection Home page

TRUSS-ITN (Training in Reducing Uncertainty in Structural Safety) is a Marie Skłodowska-Curie Innovative Training Network (ITN) funded by the European Union under the Horizon 2020 Programme call H2020-MSCA-ITN-2014.

TRUSS-ITN gathers this understanding by bringing together an international and multidisciplinary collaboration between 4 Universities, 1 industry partner and 1 research institute from 5 European countries. The consortium undertakes and plans together to offer training at an advanced level as new concepts for monitoring, modelling and reliability analysis of structures are emerging at the time.

The project has received funding from the European Union Horizon 2020 research and innovation program under the Marie Skłodowska-Curie grant agreement No 642453.

For more information, please visit the official website.

Discover

Author: Gonzalez, Arturo; Baranowski, Piotr; O'Brien, Eugene J.; O'Brien, Eugene J.; Zuo, Guang; Martinez, Daniel

Subject: Structural health monitoring; Bridge; Reliability; Data; Infrastructure

Published Date **Author** **Title** **Subject**

10/06/2016 Mechanical characterization of braided BFRP rebars for internal concrete reinforcement Antonopoulos, Sofia; McSherry, Clavin; Byrne, Dáire

12/06/2016 Probabilistic maintenance optimisation with respect to inspection quality Zuo, Guang; Baranowski, Piotr; Gonzalez, Arturo

21/06/2016 Probabilistic maintenance optimisation for fatigue-critical components with constraints on repair access and logistics Zuo, Guang; Baranowski, Piotr; Gonzalez, Arturo

Value of inspection in steel Zuo, Guang; Baranowski, Piotr; Gonzalez, Arturo

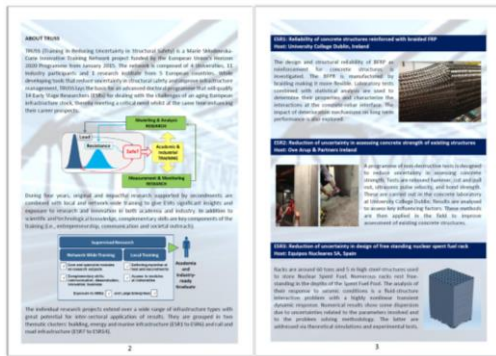
UCD research repository

4.3 BROCHURES

The brochure provides a summary of the objectives of each individual research project in addition to the overall goals of TRUSS ITN. 4,050 brochures written in an easy-to-understand language were produced for distribution in local events such as Open Days (to school students and graduates) in the Universities participating in the consortium, at national workshops and international symposia. Two types of brochures were produced: a 4-page double sided leaflet at the start of the project describing the overall objectives, and 2-page double sided half-way through the project containing interviews to PC and ESR. Also, 4 banners were designed and built for display in TRUSS events.



Cover of TRUSS ITN brochure 1



Contents of TRUSS ITN brochure 1



TRUSS ITN brochure 2



TRUSS banner

4.4 PRESS RELEASES

A summary of appearances in newspapers and TV is given below:

- Publication at Engineers Ireland magazine, “TRUSS: a Marie Skłodowska-Curie Innovative Training Network in the field of structural safety” on 14/07/15 by the PC. The article is expected to have reached 24,000 people in Scientific Community and Industry, Stake-holders.
- Acknowledgment to TRUSS in daily Spanish Regional Newspaper “El Diario Montañés,” “ENSA, a high quality research centre in Cantabria” published on 17/12/15 Emma Merino (ENSA), and was reached by about 33,400 people in the general public sector.
- Publication of two interviews to ESR9 (Matteo Vagnoli), in monthly mainstream Italian magazine “Casentino più” (Tuscany, Italy). A first interview carried out in August 2016 was published in the October 2016 issue, and the second interview, following the Genoa bridge collapse, was published on 17 August 2018. It is estimated each interview was reached by about 100,000 people from the general public.
- Publication of interview to ESR, in daily Italian newspaper “La Nazione” (Italy), carried out on 02/10/16 by ESR9 (Matteo Vagnoli), and reached by more than 150,000 people from the general public.
- Television: TRUSS supervisor and ESR appeared on Irish national television. This interview was conducted on 09/12/16 with the participation of Debra Laefer and ESR14 (Siyan Chen) reaching about 400,000 viewers.
- Publications of TRUSS news in institutional magazines, newsletters and websites from TRUSS beneficiaries, reaching above 100,000 employees and students.
- Science Impact Magazine featured interviews with ESR13 (Federico Perrotta) and PC (Arturo González) in their 2018 March issue. The impact publication was distributed in printed and digital format to 35,000 stakeholder readers worldwide.
- Open Access Government featured a 2-page article by the PC in their 2019 January issue. The readers of Open Access Government cover a wide audience across public and private sectors, including 68,974 readers from Research & Innovation & HE, 41,736 from Local Governments, 14,357 from Central Government, and 8,000 from Transport.

Further details on some of the appearances in the media above follow. The objectives of TRUSS have been published in the Website, Newsletter and Journal of Engineers Ireland in the issue of 14 July 2015 (<http://www.engineersjournal.ie/2015/07/14/truss-innovative-training-network-structural-safety/>). These three means of communication by Engineers Ireland are estimated to reach 24,000 members from every discipline of engineering throughout the island.

Engineers Ireland was established in 1835 as the professional body for engineers in Ireland, being currently one of the oldest and largest in Ireland. The Engineers Journal published by Engineers Ireland has been reporting on the latest news and views from the engineering and technology sectors in Ireland and internationally since the 1940s. In

recent years, the journal has adopted an online format (<http://www.engineersjournal.ie>), which offers immediate access anywhere, at any time, to keep members up to date with news, features and analysis of the profession of engineering and its practice. Members also receive a fortnightly eJournal newsletter with an overview of the latest content.



Article about TRUSS in Engineers Ireland (14/07/2015)

The funding received from the European Union's Horizon 2020 research and innovation programme towards TRUSS ITN is acknowledged in the Technology Section of 'El Diario Montañés' newspaper published on Thursday 17 December 2015. Being Equipos Nucleares, S.A. (ENSA) a leading company in scientific and technological research and development in the region, the publication makes reference to the participation of ENSA at an international level as beneficiary in TRUSS Innovative Training Network within their policy of Research, Development and Innovation (I+D+i). The article is titled "Equipos Nucleares, un centro de alta tecnología en Cantabria" (Equipos Nucleares, a center for high technology in Cantabria).

El Diario Montañés (<http://www.eldiariomontanes.es/>) is a regional general interest daily newspaper for Cantabria (Spain), and one of the best-selling regional newspapers in Spain with a circulation of 33,374 copies reported in the 2009-2010 period (Source: Miguel A. Pereyra, Hans-Georg Kotthoff and Robert Cowen, 24 March 2012).



TRUSS ITN acknowledged in Spanish newspaper (17/12/2015)

The journalist Eugenio Milizia interviewed ESR9, Matteo Vagnoli, at the beginning of August 2016, for Casentino Più, a mainstream monthly Italian magazine (<http://www.casentinopiu.it/eccellenze-i-cervelli-casentinesi-che-si-fanno-onore-allesterio-fotogallery/>). In the interview, Matteo spoke about TRUSS, the objectives of his research and his future goals. The interview was published in the October issue of "Casentino più" magazine under the gold list Section

in an article titled "Eccellenze, the "brains" Casentino you are a credit abroad!". Eugenio Milizia covers young Casentino (generally under 40), who, through sacrifice and studies have been accomplished in their field. Interviewing them, they realized that some of them had found their way not in Casentino, and even in Italy, but abroad. Matteo was interviewed again by Casentino più for their 2018 August issue, this time about artificial intelligence and structural health monitoring, following the collapse of the Genoa bridge. The article can be read on <http://www.casentinopiu.it/tragedia-di-genova-ling-matteo-vagnoli-il-futuro-e-lintelligenza-artificiale/>.

A third interview to Matteo was published by Francesca Manganion in the newspaper "La Nazione" on the 2 October 2016. The title of the chronicle is "They fly in the studies here, smashing abroad: the story of Matteo and Costanza". In the article, you can read how the young Casentino Matteo Vagnoli "fled abroad" in search of better opportunities, higher earnings and some satisfaction. Matteo, born in Bibbiena 27 years ago, has a nuclear engineer degree achieved in record time at the Polytechnic of Milan, and following praise and excellent track record with major publications thanks a year of waiting for the master's degree research, Matteo sought an opportunity abroad, winning a scholarship funded by the European Union at University of Nottingham. The first issue of La Nazione appeared on 8 July 1859. In 2012, La Nazione sold 52,653,953 copies (Source: https://en.wikipedia.org/wiki/La_Nazione).



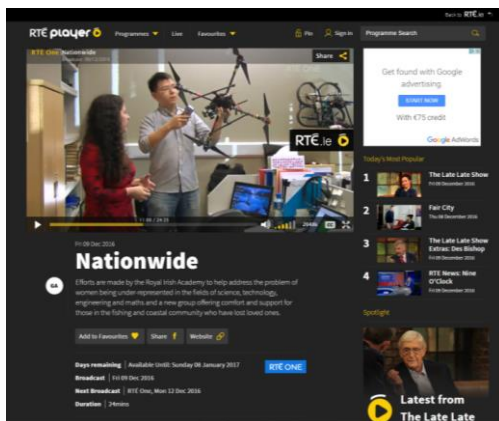
Matteo Vagnoli in Italian magazine (02/10/2016)



Matteo Vagnoli in Italian magazine (17/08/2018)

Nationwide is a television programme shown in Ireland each Monday, Wednesday and Friday evening at 19:00. Broadcast on RTE One for around 30 minutes, it is presented by Anne Cassin and Mary Kennedy. On the Friday 9 December 2016, Anne Cassin refers to how “unfortunately women continue to be under-represented in the fields of science, technology, engineering and maths (STEM). Recently the Royal Irish Academy, which is Ireland’s leading body of experts in the sciences and humanities, decided it could and should do something to help address that problem and so along with management consulting firm Accenture, it set up the Women on Walls campaign to try to combat the issue in a visual way“. Then, Will Goodbody reports on Prof. Debra Laefer, TRUSS supervisor and one of the 8 female contemporary scientists represented in the Women on Walls painting. He introduces Debra as “a UCD engineer leading a team designing systems to produce tridimensional images of buildings and structures from the air“. Siyuan Chen is part of this team and his TRUSS project, ESR14, an example of how to gather 3D features from structures, and more specifically, from road infrastructure. Siyuan Chen is featured besides Prof Laefer in the picture below.

Nationwide focuses on human interest stories and cultural events across the country. The show began airing in the early 1990s, it is RTE’s main regional programme, and its average audience for 2009 was 400,000 viewers (Source: https://en.wikipedia.org/wiki/RTE%2C3%89_One).



TRUSS ESR14, Siyuan Chen, on Irish national television (9 December 2016)

The photo below shows page 3 of the Technical News issue 100 (January 2017) by Arup Ireland, where it is possible find an article about TRUSS mid-term review at Arup. The article is written by Dr. Salam Al-Sabah, who reports on the mid-term review meeting held in Arup’s Dublin Office over two days at the beginning of December 2016. The meeting was attended by the Project Officer and External Assessor from the Commission, and more than 30 participants from the consortium. Arup Ireland Technical News is edited by Macdara Ferris and published monthly, for internal circulation only, on the first Monday of the month. This is an example of how the communication offices of our partners are used to disseminate TRUSS ITN via articles in institutional magazines. Ove Arup and partners is one of the largest engineering consulting firms in Ireland, with over 550 qualified and accredited engineers and staff in our four

offices. The Arup Group has over 14,000 staff based in 92 offices across 42 countries (2016).

Other examples of dissemination by TRUSS beneficiaries include institutional newsletters (i.e., Phimeca, the 2017 Spring Edition of the College of Engineering and Architecture Alumni Newsletter in UCD featuring the outreach activity by TRUSS at Willow Junior School) and websites (i.e., Universitat Politecnica Catalunya, with about 30,000 students and 2,500 professors and researchers, University College Dublin, the largest Irish University with over 32,000 students and 1,482 faculty members, Equipos Nucleares S.A., with 388 employees serving over ninety nuclear power plants around the world and Lloyd’s Register with some 8,000 employees operating in 78 countries).



TRUSS news published by communication office of Arup (January 2017)

Pages 64 to 66 of 2018 March issue of Science Impact (<http://www.impact.pub>) published an interview to PC and ESR13 titled “Training the next generation”. This issue features content from world’s leading research agencies, policy groups, universities and research projects with an editorial focus on ETN’s / ITN’s within materials research, highlighting training and development of ESR’s, and the current and future challenges being faced. The article helps TRUSS to communicate the objectives and work of the project in a more easily understandable and accessible language to a wider audience of stakeholders, enabling widespread dissemination. The article has a reliable, persistent link at <https://doi.org/10.21820/23987073.2018.64>, is indexed in all major search platforms including Google Scholar and is deposited in Portico.



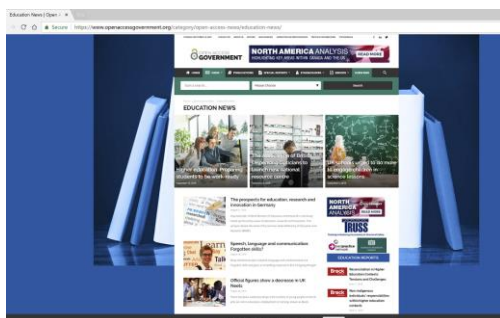
TRUSS article in Science Impact (March 2018)

Open Access Government (www.openaccessgovernment.org/) featured an article about TRUSS in the pages 206 and 207 of their 2019 January edition. This issue contains a number of high-quality articles on government policy issues from all

around the world, including health and social care, research and innovation, education, transport, environment, energy, ICT, blockchain innovation, government, as well as legal affairs. Most recent issues from Open Access Government have above 200,000 reach and 50,000 engagements. To avail of this level of exposure, a TRUSS banner directly linked to TRUSS website has been made available in the right-hand side of the Education and Research page of Open Access Government and on relevant articles during 12 months from September 2018.



TRUSS article in Open Access Government (01/01/2019)



TRUSS banner in Open Access Government (10/09/2018)

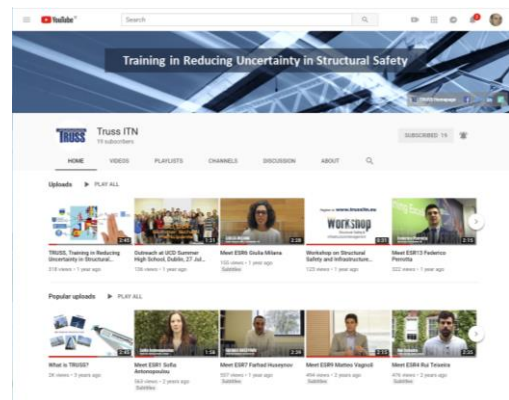
4.5 VIDEOS

High-quality videos have been made available to the general public through YouTube TRUSS ITN Channel. Currently the channel (<https://www.youtube.com/c/TrussITN>) has 19 subscribers and features almost 1 hour of recordings distributed between 22 videos that have been viewed 8,053 times. These videos deal with the following themes:

- 1 video (the first), implemented using VideoScribe, describes the objectives of TRUSS and the consortium during 2:45 minutes. There are two files associated with this video, titled “What is TRUSS?” and “TRUSS, Training in Reducing Uncertainty in Structural Safety” with 2,090 and 318 views respectively.
- 1 video titled “An innovative program called TRUSS aims to protect Europe’s infrastructure for decades to come” reviews the final outputs of the project during 5 minutes.
- 4 videos (between 1:27 and 2:19 minutes long) have been recorded at outreach activities: Willow School on 10 November 2015 (299 views), Willow Park Junior School on 15 November 2016 (194 views), Mount Anville Montessori Junior School on 13 February 2017

(184 views) and UCD Summer High School on 27 July 2017 (136 views).

- 2 short videos (< 1 minute) serve the purpose of promotion for the blogs by Early Stage Researchers (95 views) and for the TRUSS workshop (123 views).
- 14 videos (between 2 and 3 minutes long each) consist of interviews to Early Stage Researchers. The collection is labelled “Meet the Fellows”. Here ESRs talk about their background, the Marie Skłodowska-Curie scheme, the objectives of their projects and the impact and benefits for society. The popularity of these videos measured by number of views is as follows: ESR1 (563 views), ESR2 (272 views), ESR3 (225 views), ESR4 (476 views), ESR5 (109 views), ESR6 (155 views), ESR7 (537 views), ESR8 (254 views), ESR9 (109 views), ESR9 (494 views), ESR10 (164 views), ESR11 (187 views), ESR12 (367 views), ESR13 (322 views), and ESR14 (223 views).



TRUSS in YouTube

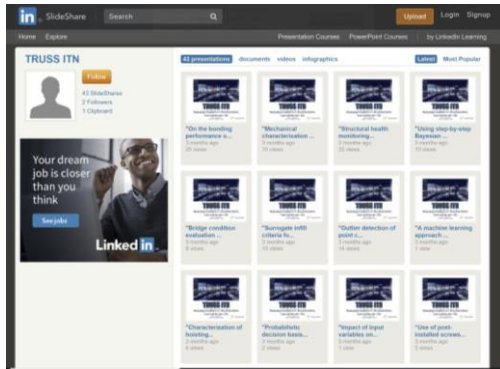
According to YouTube analytics, the total watch time of TRUSS videos have been 8,938 minutes. The top videos in watch time are “What is TRUSS?”, “Meet ESR7 Farhad Huseynov”, “Meet ESR4 Rui Teixeira”, “Meet ESR9 Matteo Vagnoli” and “Meet ESR1 Sofia Antonopoulou” that have been viewed during 2,200, 778, 642, 562 and 556 minutes respectively.

The top visitor countries to YouTube channel are: Ireland (803 views and 756 minutes), Portugal (222 views and 363 minutes), Spain (174 views and 254 minutes), UK (148 views and 197 minutes), Azerbaijan (107 views and 172 minutes), Italy (85 views and 136 minutes), Turkey (48 views and 84 minutes), Belgium (39 views and 50 minutes), France (36 views and 36 minutes), and Greece (25 views and 29 minutes). The number of views is distributed among age groups as follows: 43.9% from 25 to 34 years (average view duration of 1:45), 16.0% from 35 to 44 years (average view duration of 2:28), and 40.1% from 45 to 54 years (average view duration of 0:18). The gender distribution is 25.1% female with an average view duration of 1:54, and 74.9% male with an average view duration of 1:00.

4.6 PRESENTATIONS

Presentations have been made available to the general public in TRUSS website and through TRUSS SlideShare on <https://www.slideshare.net/TRUSSITN/presentations>.

More info about other communication channels can be found on <http://trussitn.eu/page?p=11828>.



TRUSS in SlideShare

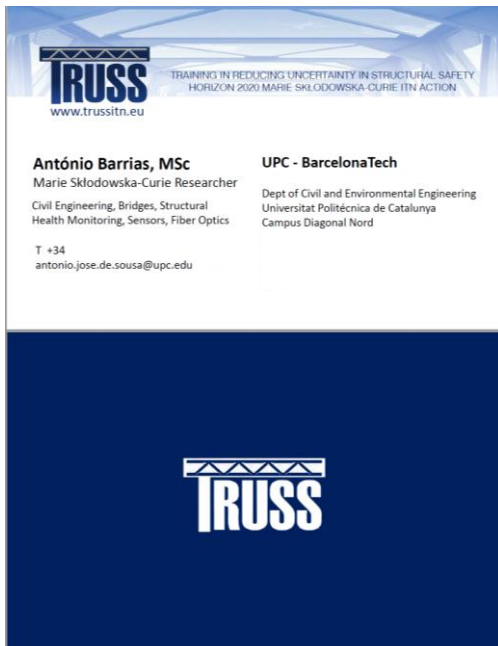
There are 43 presentations, most of which have been delivered in TRUSS workshop and symposia, and viewed 9,275 times in SlideShare. The 14 most popular presentations add to 6,285 views as follows:

- "Reliability assessment of braided FRP reinforcement for concrete structures" presented at ESREL2017 by ESR1 (739 views)
- "Reliability-based inspection planning in view of both crack initiation and propagation" presented at ESREL2017 by ESR5 (580 views)
- "Structural probabilistic assessment of offshore wind turbine operation fatigue based on Kriging interpolation" presented at ESREL2017 by ESR4 (533 views)
- "A fuzzy-based Bayesian Belief Network approach for railway bridge condition monitoring and fault detection" presented at ESREL2017 by ESR9 (492 views)
- "The effect of angles and distance on image-based three-dimensional reconstructions" presented at ESREL2017 by ESR14 (445 views)
- "Exe North bridge field testing" at ESREL2017 by ESR7 (443 views)
- "UPC-BarcelonaTech experience on the use of Rayleigh based distributed optical fiber sensors for SHM of concrete structures" presented at ESREL2017 by ESR10 (428 views)
- "Post-installed screws for in-situ assessment of mortar strength" presented at ESREL2017 by ESR2 (416 views)
- "Parametric analysis of modelling governing the seismic response of free-standing spent fuel racks" presented at ESREL2017 by ESR3 (404 views)
- "Field characterization of location-specific dynamic amplification factors towards fatigue calculations in ship unloaders" presented at ESREL2017 by ESR6 (397 views)
- "Comparative study on Bayesian updating of bridge safety model" presented at ESREL2017 by ESR8 (379 views)
- "Using truck sensors for road pavement performance investigation" presented at ESREL2017 by ESR13 (361 views)
- "Evaluation of the Hilbert Huang transformation of transient signals for bridge condition assessment" presented at ESREL2017 by ESR10 (341 views)
- "Pavement condition measurement at high speed using a TSD" presented at ESREL2017 by ESR12 (327 views)

Chapter 5: Publications

5.1 CONFERENCE PAPERS

ESRs participated in two dedicated Symposia about TRUSS ITN that are described in the next sub-sections, followed by a list of all presentations in conferences. For networking purposes, all ESRs had their own customized TRUSS branded business cards.



Example of TRUSS business card

5.1.1 TRUSS symposium 1

TRUSS researchers participated at the Symposium titled “TRUSS, A Marie Skłodowska-Curie Innovative Training Network in Structural Safety”, held as part of the 27th edition of the ESREL (European Safety and Reliability) conference series in Portoroz (Slovenia) from 18th to 22nd June 2017.

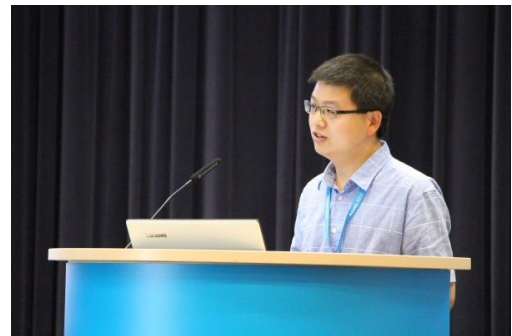


Conference opening

The TRUSS symposium was featured on Tuesday 20th from 15:40 to 17:20 and on Wednesday 21st from 14:00 to 17:40. About 700 research and industry professionals were registered to the conference. Following review by the technical

programme committee consisting of 122 members, 455 papers were selected for publication and presentation at the conference. Amongst them, the following papers were selected to be presented by ESRs within the TRUSS symposium:

- “Reliability-based inspection planning in view of both crack initiation and propagation” by G. Zou (ESR5), K. Banisoleiman and A. Gonzalez.



Guang Zou at ESREL2017

- “A Bayesian Belief Network approach for railway bridge condition monitoring and fault detection” by M. Vagnoli (ESR9), R. Remenyte-Prescott and J. Andrews.



Matteo Vagnoli at ESREL2017

- “UPC – Barcelona Tech experience on the use of Rayleigh based distributed optical fiber sensors for SHM of concrete structures” by A. Barrias (ESR11), J.R. Casas, S. Villalba and G. Rodriguez.



Antonio Barrias at ESREL2017

- “Using truck sensors for road pavement performance investigation” by F. Perrotta (ESR13), T. Parry and L.C. Neves.



Federico Perrotta at ESREL2017

- “Pavement condition measurement at high velocity using a TSD” by A. Malekjafarian, D. Martinez Otero (ESR12) and E.J. OBrien.



Daniel Martinez at ESREL2017

- “Evaluation of Hilbert-Huang transformation of transient signals for bridge condition assessment” by J. Moughty (ESR10) and J.R. Casas.



John Moughty at ESREL2017

- “Comparative study on Bayesian updating of bridge safety model” by B. Heitner (ESR8), E.J. OBrien, F. Schoefs, T. Yalamas and C. Leahy.



Barbara Heitner at ESREL2017

- “Field characterization of location-specific dynamic amplification factors towards fatigue calculations in ship unloaders” by G. Milana (ESR6), K. Banisoleiman and A. Gonzalez.



Giulia Milana at ESREL2017

- “Reliability assessment of braided BFRP reinforcement for concrete structures” by S. Antonopoulou (ESR1) and C. McNally.



Sofia Antonopoulou at ESREL2017

- “Structural probabilistic assessment of offshore wind turbine operation based on Kriging response interpolation” by R. Teixeira (ESR4), A. O’Connor, M. Nogal, J. Nichols and M. Spring.



Rui Teixeira at ESREL2017

- “Tracking deflection in the field using optical system: a case study” by Y. Xu, F. Huseynov (ESR7), J.M.W. Brownjohn, E.J. OBrien and D. Hester.
- “The effect of angles and distance on image-based three-dimensional reconstructions” by S. Chen (ESR14), D.F. Laefer, J. Byrne and A.S. Natanzi.



Siyuan Chen at ESREL2017

- “Post-installed concrete screws for in-situ assessment of mortar strength” by M.S.N. A. Sourav (ESR2), S. Al-Sabah and C. McNally.



Shah Nur Sourav at ESREL2017

- “Sensitivity analysis of a finite element model for the seismic analysis of free-standing spent fuel racks” by A. Gonzalez Merino (ESR3), L. Costas and A. Gonzalez.



Alberto González Merino at ESREL2017

The TRUSS symposium was chaired by the PC. Each presentation was allocated 15 minutes, with an additional 5 minutes for discussion. Other TRUSS researchers at the symposium included Luis Costas from Equipos Nucleares (ESR3 supervisor), Maria Nogal from Trinity College Dublin (ESR4 co-supervisor), Frank Schoefs from Universite de Nantes (ESR8 co-supervisor), Rasa Remenyte-Prescott and John Andrews from University of Nottingham (ESR9 supervisors), Joan Ramon Casas from University Politécnica Catalunya (ESR10 and ESR11 supervisor) and Eugene OBrien from University College Dublin (ESR7, ESR8 and ESR12 supervisor).



TRUSS symposium at ESREL 2017

5.1.2 TRUSS symposium 2

TRUSS researchers participated at the Special Session SS-6 titled “TRUSS ITN – Reducing Uncertainty in Structural Safety”, which is the last network-wide event planned in the grant agreement of the project. This Special Session about TRUSS was held as part of the 6th International Symposium on Life-Cycle Civil Engineering in Ghent (Belgium) from 28th to 31st October 2018. The contents of TRUSS were divided in two sub-sessions dealing with:

- Buildings, wind turbine towers, nuclear structures, ships and ship unloaders, within TRUSS WP4, characterized by the aggressive environments that are subjected to (corrosive, radioactive, non-linear structural responses) or relatively high uncertainties regarding materials and modelling (Monday 29th October from 10:30 am to 12:00 pm chaired by Joan Ramon Casas and Ciaran McNally).



Joan and Ciaran chairing the morning session

- Road and rail transport infrastructure, within TRUSS WP5, characterized by the variable traffic load (Monday 29th October, from 2:30 pm to 4:00 pm chaired by Ciaran McNally and Arturo Gonzalez, and from 4:30 pm to 5:15 pm chaired by Arturo Gonzalez).



Siyuan presenting in the afternoon session

The International Association for Life-Cycle Civil Engineering (IALCCE) brought together more than 400 people to share all the very best work done in the field of life-cycle civil engineering and related topics covering 8 Keynote Lectures, the Fazlur R. Khan Plenary Lecture, and 390 technical papers that included the following papers included in the TRUSS Special Session:

- “Mechanical characterisation of braided BFRP rebars for internal concrete reinforcement” by S. Antonopoulou (ESR1) , C. McNally and Greg Byrne.



Sofia Antonopoulou at IALCCE2018

- “Use of post-installed screws in the compressive strength assessment of in-situ concrete” by M.S.N. A. Sourav (ESR2), S. Al-Sabah and C. McNally.



Shah Nur Sourav at IALCCE2018

- “Impact of input variables on the seismic response of free-standing spent fuel racks” by A. Gonzalez Merino (ESR3), L. Costas and A. Gonzalez.



Alberto González Merino at IALCCE2018

- “Surrogate infill criteria for operational fatigue reliability analysis” by R. Teixeira (ESR4), A. O’Connor and M. Nogal.



Rui Teixeira at IALCCE2018

- “Probabilistic decision basis and objectives for inspection planning and optimization” by G. Zou (ESR5), K. Banisoleiman and A. Gonzalez.
- “Characterization of hoisting operations on the dynamic response of the lifting boom of a ship unloader” by G. Milana (ESR6), K. Banisoleiman and A. Gonzalez.



Giulia Milana at IALCCE2018

- “Monitoring crack movement on a masonry type abutment using optical camera system – a case study” by F. Huseynov (ESR7), E.J. OBrien, J.M.W. Brownjohn, K. Faulkner, Y. Xu and D. Hester.
- “Outlier detection of point clouds generating from low-cost UAVs for bridge inspection” by S. Chen (ESR14), L.C. Truong-Hong, E. O’Keeffe, D.F. Laefer and E. Mangina.



Siyuan Chen at IALCCE2018

- “Using step-by-step Bayesian updating to better estimate the reinforcement loss due to corrosion in reinforced concrete structures” by F. Schoefs, B. Heitner (ESR8), T. Yalamas, G. Causse and E.J. OBrien.



Barbara Heitner at IALCCE2018

- “Structural health monitoring of bridges: A Bayesian network approach” by M. Vagnoli (ESR9), R. Remenye-PreScott and J. Andrews.
- “Noninvasive empirical methods of damage identification of bridge structures using vibration data” by J. Moughty (ESR10) and J.R. Casas.



John Moughty

- “Bridge condition evaluation using LDVs installed on vehicle” by D. Martinez Otero (ESR12), A. Malekjafarian and E.J. OBrien.



Daniel Martinez at IALCCE2018

- “On the bonding performance of Distributed Optical Fiber Sensors (DOFS) in structural concrete” by A. Barrias (ESR11), J.R. Casas and S. Villalba.



Antonio Barrias at IALCCE2018

- “A machine learning approach for the estimation of fuel consumption related to road pavement rolling resistance for large fleets of trucks” by F. Perrotta (ESR13), T. Parry, L.C. Neves and M. Mesgarpour.

Each presentation was allocated 12 minutes with an additional 3 minutes for discussion. The Special Session about TRUSS was attended by approximately 40 people that included Luis Costas from Equipos Nucleares (ESR3 supervisor), Joan Ramon Casas from University Politecnica Catalunya (ESR10 and ESR11 supervisor), and Ciaran McNally (ESR1 and ESR2 supervisor) and Arturo Gonzalez (PC) from University College Dublin. By participating at this event, ESRs had the chance of promoting their research and professional work, learn and discuss about the latest accomplishments, innovations and potential future directions with other university researchers, representatives from all sections of civil engineering, and engineers working with

engineering companies, consultants, contractors and local authorities, with a common interest in life-cycle civil engineering.



Siyuan, Barbara, Alberto, Antonio, Daniel, Shah Nur, Giulia, Rui and Arturo at IALCCE 2018

5.1.3 Conference contributions

This section provides full references for contributions to conferences in the form of oral presentations and/or full papers by TRUSS researchers grouped under three headings: 'About the overall TRUSS project', 'About WP4. Buildings, Energy and Marine Infrastructure' and 'About WP5. Rail and Road Infrastructure'.

About the overall TRUSS ITN project:

- [1] González, A., Barrias, A., Teixeira, R., Martínez, D., Heitner, B., Antonopoulou, S., Zou, G., González Merino, A., Sourav, S.-N., Casas, J.R., O'Connor, A., Nogal, M., O'Brien, E.J., Yalamas, T., McNally, C., Banisoleiman, K., Costas, L. and Al-Sabah, S. (2018), 'TRUSS, a European innovative training network dealing with the challenges of an aging infrastructure network', in *Proceedings of 7th Asia-Pacific Workshop on Structural Health Monitoring (APWSHM 2018)*, Hong Kong SAR, P.R. China, November 12-15. <http://hdl.handle.net/10197/9567>
- [2] González, A. (2018), 'The TRUSS ITN project (2015-19): a Marie Skłodowska-Curie innovative training network on reducing uncertainty in structural safety', in *Proceedings of the Civil Engineering Research in Ireland Conference (CERI 2018)*, Dublin, Ireland, August 29-30. <https://researchrepository.ucd.ie/handle/10197/9544>
- [3] González, A. (2018), 'Contributions by Marie Skłodowska-Curie TRUSS-ITN towards reducing uncertainty in structural safety of bridges', in *10th International Conference on Short and Medium Span Bridges (SMSB 2018)*, Quebec City, Canada, July 31 - August 3. (Oral presentation)
- [4] Gonzalez, A., Martinez, D., O'Brien, E.J., Casero, M., Moughty, J.J., Casas, J.R., Vagnoli, M., Remenyte-Prescott, R., Andrew, J., Huseynov, F. and Brownjohn, J. (2018), 'TRUSS-ITN methods for detecting bridge damage from response to traffic', in *Proceedings of 9th International Conference on Bridge Maintenance, Safety and Management (IABMAS 2018)*, Melbourne, Australia, July 9-13.
- [5] González, A. (2018), 'TRUSS, a Marie Skłodowska-Curie network assessing uncertainty associated to buildings, energy and transport infrastructure', in *2nd International Conference on Civil Engineering (ICOCE 2018)*, Da Nang, Vietnam, May 5-7. (Oral presentation)
- [6] González, A., Perrotta, F., Milana, G., Zou, G., Teixeira, R., González Merino, A., Sourav, S.-N. A., Antonopoulou, S., McNally, C., Al-Sabah, S., Costas, L., O'Connor, A., Nogal, M., Banisoleiman, K., Faber, M.H., Parry, T. and Neves, L. (2018), 'Contributions by Marie Skłodowska-Curie TRUSS-ITN towards reducing uncertainty in structural safety of buildings, roads, energy and marine infrastructure', in *Proceedings of 3rd International Conference on Vulnerability and Risk Analysis and Management + 7th International Symposium on Uncertainty Modelling and Analysis + 4th International Symposium on Uncertainty Quantification and Stochastic Modelling (ICVRAMISUMA2018)*, Florianópolis, Brazil, April 8-11. <http://hdl.handle.net/10197/9412>
- [7] González, A., Huseynov, F., Heitner, B., Vagnoli, M., Moughty, J.J., Barrias, A., Martinez, D., Chen, S., O'Brien, E., Laefer, D., Casas, J.R., Remenyte-Prescott, R., Yalamas, T. and Brownjohn, J. (2017), 'Structural health monitoring developments in TRUSS Marie Skłodowska-Curie innovative training network', in *Proceedings of 8th International Conference on Structural Health Monitoring of Intelligent Infrastructure (SHMII-8)*, Brisbane, Australia, December 5-8. <http://hdl.handle.net/10197/9069>
- [8] González, A. (2017), 'Developments in damage assessment by Marie Skłodowska-Curie TRUSS ITN project', in *Proceedings of 12th International Conference on Damage Assessment of Structures (DAMAS 2017)*, Kitakyushu, Japan, July 10-12. <https://doi.org/10.1088/1742-6596/842/1/012039>, <http://hdl.handle.net/10197/8756>

About WP4. Buildings, Energy and Marine Infrastructure:

- [9] Antonopoulou, S., McNally, C. and Byrne, G. (2018), 'Mechanical characterisation of braided BFRP rebars for internal concrete reinforcement', in *Proceedings of the 6th International Symposium on Life-Cycle Civil Engineering (IALCEE 2018)*, Ghent, Belgium, October 28-31.
- [10] Antonopoulou, S., McNally, C. and Byrne, G. (2018), 'A comparative study on different BFRP rebar design methodologies', in *Proceedings of the Civil Engineering Research in Ireland Conference (CERI 2018)*, Dublin, Ireland, August 29-30. <http://hdl.handle.net/10197/9545>
- [11] Antonopoulou, S. and McNally, C. (2018), 'Fatigue behavior of braided BFRP rebars for civil engineering applications', in *4th International Conference on Mechanics of Composites (MechComp 2018)*, Madrid, Spain, July 9-12. (Oral presentation)
- [12] Antonopoulou, S. and McNally, C. (2018), 'Micro-CT analysis of braided BFRP composites for civil engineering applications', in *18th European Conference on Composite Materials (ECCM 2018)*, Athens, Greece, June 24-28. (Oral presentation)
- [13] Antonopoulou, S. and McNally, C. (2017), 'Reliability assessment of braided BFRP reinforcement for concrete structures', in *Proceedings of 27th European Safety and Reliability Conference (ESREL 2017)*, Portoroz, Slovenia, June 18-22. <https://doi.org/10.1201/9781315210469-353>, <http://hdl.handle.net/10197/8753>
- [14] Antonopoulou, S., McNally, C. and Byrne, G. (2017), 'The effect of braiding parameters on the performance of braided BFRP composites for concrete reinforcement', in *8th International Conference on Composites Testing and Model Identification (CompTest2017)*, KU Leuven, Belgium, April 05-07. (Oral presentation)
- [15] Antonopoulou, S., McNally, C. and Byrne, G. (2016), 'Development of braided basalt FRP rebars for reinforcement of concrete structures', in *Proceedings of 8th International Conference on Fibre-Reinforced Polymer (FRP) Composites in Civil Engineering (CICE 2016)*, Hong Kong, China, December 14-16. <http://hdl.handle.net/10197/8289>
- [16] Antonopoulou, S., McNally, C. and Byrne, G. (2016), 'Developing braided FRP reinforcement for concrete structures', in *Proceedings of Civil Engineering Research in Ireland Conference (CERI 2016)*, Galway, Ireland, August 29-30. <http://researchrepository.ucd.ie/handle/10197/8038>
- [17] Sourav, S.N.A., Al-Sabah, S. and McNally, C. (2018), 'Use of post-installed screws in the compressive strength assessment of in-situ concrete', in *Proceedings of the 6th International Symposium on Life-Cycle Civil Engineering (IALCEE 2018)*, Ghent, Belgium, October 28-31.
- [18] Sourav, S.N.A., Al-Sabah, S. and McNally, C. (2018), 'Statistical reliability of the screw pullout test in the assessment of in-situ concrete strength', in *Proceedings of Civil Engineering Research in Ireland Conference (CERI 2018)*, Dublin, Ireland, August 29-30.
- [19] Sourav, S.N.A., Al-Sabah, S. and McNally, C. (2017), 'Post-installed screws for in-situ assessment of mortar strength', in *Proceedings of 27th European Safety and Reliability Conference (ESREL 2017)*, Portoroz, Slovenia, June 18-22. <http://researchrepository.ucd.ie/handle/10197/9037>
- [20] Sourav, S.N.A., Al-Sabah, S. and McNally, C. (2016), 'Strength assessment of in-situ concrete for the evaluation of structural capacity: State of the art', in *Proceedings of Civil Engineering Research in Ireland Conference (CERI 2016)*, Galway, Ireland, August 29-30. <http://researchrepository.ucd.ie/handle/10197/8250>
- [21] Gonzalez Merino, A., Costas, L. and Gonzalez, A. (2018), 'Impact of input variables on the seismic response of free-standing spent fuel racks', in *Proceedings of the 6th International Symposium on Life-Cycle Civil Engineering (IALCEE 2018)*, Ghent, Belgium, October 28-31.

- [22] Gonzalez Merino, A., Costas, L. and Gonzalez, A. (2018), 'Vibration tests of an underwater free-standing 2-rack system' in *Proceedings of Civil Engineering Research in Ireland Conference (CERI 2018)*, Dublin, Ireland, August 29-30. <http://hdl.handle.net/10197/9543>
- [23] Gonzalez Merino, A., Costas, L. and Gonzalez, A. (2018), 'Impact of analysis parameters on the seismic response of free-standing spent fuel racks', in *Proceedings of ANS Best Estimate Plus Uncertainty International Conference (BEPU 2018)*, Lucca, Italy, May 13-19. <http://hdl.handle.net/10197/9540>
- [24] Gonzalez Merino, A., Costas, L. and Gonzalez, A. (2017), 'Parametric analysis of modelling properties governing the seismic response of free-standing spent fuel racks', in *Proceedings of 27th European Safety and Reliability Conference (ESREL 2017)*, Portoroz, Slovenia, June 18-22. <https://doi.org/10.1201/9781315210469-345>, <http://hdl.handle.net/10197/8747>
- [25] Gonzalez Merino, A., Costas, L. and Gonzalez, A. (2016), 'Uncertainties in seismic design of free-standing HDSFS racks' in *Proceedings of the ninth International Youth Nuclear Congress (IYNC2016)*, Hangzhou, China, July 24-30. (Selected within best papers) <http://researchrepository.ucd.ie/handle/10197/7810>
- [26] Gonzalez Merino, A., Costas, L. and Gonzalez, A. (2016), 'Dynamic analysis of the nonlinear response of high density fuel storage racks' in *Proceedings of Civil Engineering Research in Ireland Conference (CERI 2016)*, Galway, Ireland, August 29-30. (Selected within best papers) <http://hdl.handle.net/10197/7909>
- [27] Teixeira, R., O'Connor, A.J. and Nogal, M. (2018), 'Surrogate infill criteria for operational fatigue reliability analysis', in *Proceedings of the 6th International Symposium on Life-Cycle Civil Engineering (IALCEE 2018)*, Ghent, Belgium, October 28-31.
- [28] Teixeira, R., Nogal, M. and O'Connor, A.J. (2018), 'On the calculation of offshore wind turbine load spectra for fatigue design', in *Proceedings of the 19th International Colloquium on Mechanical Fatigue of Metals (ICMFM XIX)*, Porto, Portugal, September 5-7.
- [29] Teixeira, R., O'Connor, A.J. and Nogal, M. (2018), 'Application of Gaussian process regression for structural analysis', in *Proceedings of Civil Engineering Research in Ireland Conference (CERI 2018)*, Dublin, Ireland, August 29-30.
- [30] Teixeira, R., O'Connor, A.J. and Nogal, M. (2018), 'Interpolation of confidence intervals for fatigue design using a surrogate model', in *Proceedings of International Forum on Engineering Decision Making*, Lake Louise, Canada, May 6-9.
- [31] Teixeira, R., O'Connor, A.J., Nogal, M., Nichols, J. and Krishnan, N. (2017), 'Analysis of the design of experiments of offshore wind turbine fatigue reliability design with Kriging surfaces', in *Proceedings of International Conference on Structural Integrity (ICSI2017)*, Funchal (Portugal), September 4-7, pp. 8. <http://hdl.handle.net/2262/81840>
- [32] Teixeira, R., O'Connor, A.J., Nogal, M., Nichols, J. and Spring, M. (2017), 'Structural probabilistic assessment of offshore wind turbine operation fatigue based on Kriging interpolation', in *Proceedings of 27th European Safety and Reliability Conference (ESREL 2017)*, Portoroz, Slovenia, June 18-22. <http://hdl.handle.net/2262/81841>
- [33] Teixeira, R., O'Connor, A.J. and Nogal, M. (2016), "Comparative analysis of the probabilistic methods to estimate the probability of failure of offshore wind turbine towers", in *Proceedings of Civil Engineering Research in Ireland Conference (CERI 2016)*, Galway, Ireland, August 29-30. <http://www.tara.tcd.ie/handle/2262/77413>
- [34] Zou, G., Banisoleiman, K. and Gonzalez, A. (2018), 'Probabilistic decision basis and objectives for inspection planning and optimization', in *Proceedings of the 6th International Symposium on Life-Cycle Civil Engineering (IALCEE 2018)*, Ghent, Belgium, October 28-31.
- [35] Zou, G., Banisoleiman, K. and Gonzalez, A. (2018), 'Probabilistic maintenance optimization for fatigue-critical components with constraint in repair access and logistics', in *Proceedings of the 14th International Conference on Probabilistic Safety Assessment and Management (PSAM14)*, Los Angeles, CA, USA, September 16-21. <http://hdl.handle.net/10197/9570>
- [36] Zou, G., Banisoleiman, K. and Gonzalez, A. (2018), 'Probabilistic maintenance optimization with respect to inspection quality', in *Proceedings of the 16th International Probabilistic Workshop (IPW 2018)*, Vienna, Austria, September 12-14. <http://hdl.handle.net/10197/9571>
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5.3 TECHNICAL/SCIENTIFIC REPORTS

Technical/scientific deliverables and reports available for free to the public include:

- PhD thesis titled "Development of optical fibre distributed sensing for the structural health monitoring of bridges and large scale structures", successfully defended by Antonio Barrias (ESR11) on 5 November 2018.
- PhD thesis titled "Probabilistic Methods for Life Cycle Management of Steel Structures under Fatigue", successfully defended by Guang Zou (ESR5) on 23 January 2019.
- One hundred 91-page books about the project were specifically printed for the workshop on the 29 August 2018. The book is available online at <http://trussitn.eu/page?p=16945>.



Front cover of book at the TRUSS workshop

- A final report about work package WP3 on Structured Training (58 pages).
- A final report about work package WP4 on Research covering Buildings, Energy and Marine Infrastructure (43 pages).
- A final report about work package WP5 on Research covering Rail and Road Infrastructure (56 pages).

The three final reports above are project deliverables that can be downloaded from the Cordis or TRUSS websites. While only two ESRs have passed their VIVA examination at the

time of this report, it is expected that the number of thesis in TRUSS will increase shortly. For instance, eight ESRs have already submitted their thesis for the degree of PhD and are awaiting their VIVA, while the remaining four ESRs are finalising their thesis.



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