AIMLAC CDT Newsletter

Welcome to the second edition of the UKRI AIMLAC CDT Newsletter

Dear all,

Let me start by wishing you a very happy new year! I hope you are in good health and are coping with the everchanging levels of lockdown. I have no doubt 2021 will be a major improvement on 2020.

Our AIMLAC CDT, in close collaboration with the STFC-funded Data Intensive (DI) CDT, has had a memorable year. The training activities for the first combined AIMLAC/DI cohort, with 15 students, moved successfully online with virtual meetings in “Bangor” and “Swansea”. A description of the face-to-face and online training delivered by the Supercomputing Wales Research Software Engineers is given further down in this newsletter. Along the way we became experts in breakout rooms and screen sharing, and have gotten used to the sentence: “Can you please mute yourself…?”

We welcomed the 2nd cohort, with a total of 18 students, in the “Cardiff” meeting in September; a full list of projects is given in this newsletter as well. The now 2nd year students met with external partners to arrange their placements. I am very pleased all students and partners found combinations to their liking. Special thanks to Rhian, Roz, and Rosemary for managing an exponential number of breakout rooms. At the end of the newsletter you will find which connections have been made as well as a list of external partners.

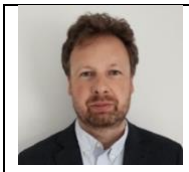
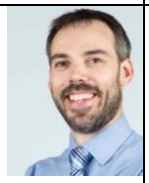
We are currently recruiting the 3rd cohort. New PhD project descriptions are available on the AIMLAC website, see cdt-aimlac.org for details. As always, the website also contains information about our activities and resources. A new activity, which is entirely student-driven, is DataAid, which connects the students with charity partners. A brief description is given here as well.

While we have not yet been able to meet in person in this 2nd year of AIMLAC, I am looking forward to do so in the coming year. Fingers crossed!

Gert Aarts
Director AIMLAC
Swansea, 5/1/2021

Meet the Management Board

http://cdt-aimlac.org/cdt-people.html

	Prof Gert Aarts - CDT Director, Swansea		Prof Biagio Lucini - CDT Technical Director, Swansea		Prof Reyer Zwiggelaar, Aberystwyth
	Rhian Melita Morris - CDT Centre Manager, Swansea		Roz Toft - CDT Research Support Officer, Swansea		Prof Jonathan Roberts, Bangor
	Prof Stephen Fairhurst, Cardiff		Dr Henning Flaecher, Bristol		Prof Sinead Brophy, Swansea
	Prof Steve Conlan, Swansea		Prof Malcolm Bremer, Bristol		Prof Roger Whitaker, Cardiff
	Dr Ed Bennett (Supercomputing Wales, SA2C)		Dr Colin Sauze (Supercomputing Wales, Aberystwyth)		Dr Michele Mesiti, (Supercomputing Wales, SA2C)

Student Representative committee

Ben Winter – Chair of the CDT Student Board
Sophie Sadler – Co-Chair of the CDT Student Board
Frank Krzyzowski - Co-Chair of the CDT Student Board
Thomas Spriggs – Student Representative for CDT, Student Representative for Swansea University CDT Governance group
Tonicha Crook – Student Representative for CDT

DataAid – Helping the Charity Sector Solve Real World Issues with Data Science
The technological world is evolving fast and many of us are not able to keep up with the amount of data that is being collected across all domains. DataAid is an exciting student led initiative that aims to empower our partner charities to better understand the data they hold, so that they can use it in the most appropriate way for their mission.

The Event
DataAid will be holding a two-day hackathon style event at the end of January next year, which will be open to all CDT students. At the event, we will aim to solve three distinct data science problems put forward by the charities. This event is an opportunity for the students to share skills across fields and cohorts and for them to engage in some real-world data science problems.

The Data Champions
In the lead up to the event we have a group of students working on each project, the Data Champions. Our Data Champions are working with their respective charities to prepare the data and shape the questions to be answered on the day of the event. They are working together in teams using a project management method we have termed Agile 'Lite' and are gaining and/or advancing their skills in a range of tools that are used in industry.

The students who are generously volunteering their time to this program are:
· Rhys Green, Team Leader, Fourth Year – Cardiff
· Joel Greer, Technical Analyst, Fourth Year – Bristol
· Natalia Sikora, Lead Communicator, First Year – Swansea
· Chris Wright, Technical Analyst, Second Year – Bristol
· Vasileios Skliris, Team Leader, Fourth Year – Swansea
· Matthew Walker, Technical Analyst, First Year – Cardiff
· Eleonora Parrag, Team Leader, Second Year – Cardiff
· Thomas Spriggs, Technical Analyst, Second Year – Swansea
· Roberta Chiovoloni, Lead Communicator, Fourth Year – Swansea
· Sophie Sadler, Lead Communicator, Second Year – Swansea
· Iwan Mitchell, Technical Analyst, First Year – Bangor
· Robbie Webbe, Technical Analyst, Second Year – Bristol
· Matt Selwood, Technical Analyst, First Year – Bristol
· Tonicha Crooke, Lead Communicator, Second Year – Swansea

Coding Challenge and Training during the CDT's first year

The coding challenge saw students working in groups to produce a piece of software, applying what was learned in their training throughout the first year. For the 2019/20 academic year the task was to write a program to predict the price of oil. This was intended for an oil tanker captain moored offshore to let them know whether they should dock today, sell and offload their cargo or wait at sea in hope that the price rises.

The challenge is intended to develop the student's skills in a number of areas. These include the technical aspects of writing software, choosing an appropriate machine learning technique to make the predictions and producing appropriate visualisations to communicate the decision. There was also the interpersonal skills of working remotely in a group and using online collaboration tools to achieve this. Little did we know in Autumn 2019 just how important learning about online remote working would become in 2020.

In total we had three groups each with five to six students representing at least four of the five universities in the CDT. Colin Sauze, the Supercomputing Wales Research Software Engineer (RSE) for Aberystwyth acted as the customer and met with the groups each month to answer any questions they had and set out the deliverables for the next month. Ed Bennett, Mark Dawson and Michele Mesiti from the Swansea University Supercomputing Wales RSE team acted as technical advisors, providing assistance on software development processes and technologies.

Throughout the year the RSEs also provided training on useful technologies and software development tools for the challenge. This began at the Software Carpentry workshop in Aberystwyth in November 2019 with a workshop covering Unix Shell, Git version control, Python and an introduction to High Performance Computing. Then in February 2020 a further session was run in Bristol on creating reproducible results in research software and cloud computing. Finally, an online session (originally planned to run in Bangor) in April covered automated testing and continuous integration.

Each group had begun the challenge by choosing three different prediction techniques which ranged from basic linear regression to deep neural networks. They obtained oil price data from online APIs such as Yahoo Finance and Quandl, some of these didn't have the most up to date data but did have plenty of historical data. This created an extra challenge of joining up data from disparate sources and getting it

into a single format that was suitable for the machine learning libraries, a very common problem when deploying machine learning on real problems.

Later in the process the groups started to look for other factors that could influence oil prices and these included the prices of other commodities, sentiment analysis of news headlines looking for things relating to oil. Unfortunately, the latter stopped working so well after March when only one story dominated the headlines. Trying to predict oil prices as the coronavirus pandemic took hold and global demand for oil slumped proved to be difficult. Like much of the industry, none of the groups managed to predict the negative pricing which occurred in late April. Much of the historical data didn't go back far enough to include a major economic shock and even where it did the shocks were on a much smaller scale. But this adds an interesting lesson on how no amount of real-world training data can prepare a machine learning system for a dramatic unprecedented event.

The groups also had to produce a user interface showing their recommendations. To add to the constraints for them the oil tanker's laptop was a very old netbook with a low resolution screen, limited memory and processing power, a 32 bit CPU, an obscure version of Linux and a simulated satellite internet connection running at just 10 kilobits per second. This meant that the user interface needed to be clean and simple and any data sent would need to be pre-processed to reduce its size. This in turn supported using a cloud based solution to process the data and make the decision with just the output being sent to the laptop.

As each team contained students from four or five different universities working online was the only option for much of the work. All the groups used Github for collaborating on code, Slack and Zoom for communicating and some used Trello for task tracking. There was a clear evolution in the complexity of their use of Github as they began to use issues, pull requests and branches to track problems and isolate different parts of the software development from each other.

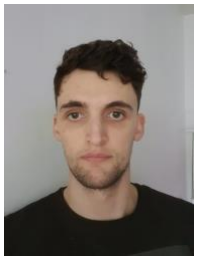
The students presented their final results to the CDT staff in June. All the groups were able to demonstrate a working system and two of the three showed that they could even turn a small profit on average.

Meet the 2020 cohort

The second cohort includes 12 students from the AIMLAC CDT, 3 students from the DI CDT, 2 iCASE students and 1 SURES student.

Research projects sit in one or more research themes:
T1: data from large science facilities (particle physics, astronomy, cosmology)
T2: Biological, health and clinical sciences (medical imaging, electronic health records, bioinformatics)
T3: novel mathematical, physical, and computer science approaches (data, hardware, software, algorithms)

Name: Paul Murphy
University: Cardiff
Research area: There is much discussion around the topic of ethics in AI, however, there has been relatively little investigation into the mechanisms by which AI can be developed to innately possess ethical or moral characteristics. This research seeks to investigate this using nature inspired approaches to develop more ethical reward functions in neural networks. Commonly, these functions are extrinsic, in that they reward measurable performance against a specific goal or task. However, there are examples where functions have been developed to provide intrinsic motivation i.e., to develop more domain-general and transferable behaviours that are additional to the pursuit of the primary goal. This research will look at whether neuroevolution can be used to develop reward functions that have intrinsic ethical motivations. And if so, can these be made transferable using approaches inspired by genetics/epigenetics?
PhD Title: Developing ethical characteristics in neural networks through neuroevolution (T3)
Hobbies/Interests: I enjoy being out amongst nature, hiking, kayaking snowboarding and campervanning. I also play piano and run a charity that supports education in rural communities and refugee camps in Myanmar.



Name: Lukas Golino
University: Swansea
Research Area: I am working in collaboration with CERN and specifically the ALPHA experiment to study the fundamental symmetries in the universe by directly comparing Hydrogen and Antihydrogen. The ALPHA Antihydrogen experiment makes use of several particle detector technologies, including a Silicon Vertex Detector, Time Projection Chamber, and a barrel of scintillating bars. One of the key challenges for these detector systems is to distinguish between

antihydrogen annihilations and cosmic rays, a classification problem machine learning can do excellently. Presently this task is done by the use of cuts based on two high-level variables from the detectors for online analysis and boosted decision trees with high-level variables in offline analysis. However, we would like to create a more accurate and quicker machine learning model that can distinguish between these cosmic rays and annihilation in real-time as the detector is running.
ALPHA (**A**ntihydrogen **L**aser **Ph**ysics **A**pparatus) is an international collaboration based at CERN, and which is working with trapped antihydrogen atoms, the antimatter counterpart of the simplest atom, hydrogen. By precise comparisons of hydrogen and antihydrogen, the experiment hopes to study fundamental symmetries between matter and antimatter to help us better understand the Baryon Asymmetry problem.
PhD Title: Machine Learning methods for Antihydrogen detection (T1)
Hobbies/Interests: Anthropology, history, geology, music, cooking, anything outdoors, hiking, skiing, free climbing, art, mathematics, travel

Name: Jack Furby
University: Cardiff University
Research Theme: My research focuses on the capabilities that a deep learning agent would need to efficiently and effectively form and function in a team with human agents. The direction I am currently exploring is the idea of a social agent which has greater cognitive abilities. This could enable a deep learning agent to build a model of a human agent (or any other agent) including the human's model of the deep learning agent. These models could then potentially be used for more expected behaviour in both future actions and explainability/tellability.
PhD Title: Human-Machine Collaboration with Deep Learning Agents (T3)
Hobbies/interests: I am an active member of The Scouts in my local area and am currently a Scout leader for a local group. Because of this I have been able to and enjoy a number of outdoor activities such as walking and camping along with international expeditions to Africa. In addition, I cook in my spare time and play pool whenever possible.

Name: David Mason
University: Swansea University
Research Area: Studying Sp(2N) gauge theories through lattice simulations, focusing on the deconfinement phase transition and the large N limit.
PhD Title: Non-perturbative dynamics and compositeness (T1)

Hobbies/Interests: Participating in game jams. Playing piano and guitar. Electronics. Digital Art.

Name: Maciek Glowacki

University: Bristol University

Research area: Investigating the Higgs Boson as a portal to the dark matter sector via Yukawa (Higgs to fermionic dark matter) couplings. Attempting to place an upper limit on the branching fraction of the Higgs to "invisible" decay with the CMS detector at the LHC.

PhD Title: Beyond Standard Model searches in jets + missing energy final states (T3)

Hobbies/Interests: I enjoy being active and exploring as well as delving into other fields - currently neuroscience has piqued my interest.

Name: Will Robinson

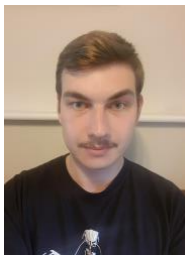
University: Aberystwyth

Research area: My research is centred on the detection and amelioration of adversarial and/or misleading data from medical imaging for cancer detection via deep learning. The goal is to prevent potential problems with adverse images before automated screening becomes widely used.

PhD Title: Detecting when Deep Learning goes wrong in Medical Image Analysis (T2, T3)

Hobbies/Interests: I enjoy making and playing video games, spending time with my family, travelling, watching movies, and attending gaming events.

Name: Frank Krzyzowski



University: Bangor University

Research area: AI and Deep Learning - In semi-supervised learning, a small portion of the data is labelled. In some cases, the labelling of these small parts is not even in terms of a given set of classes, but in the form of “same or different”. This leads to the idea of constrained clustering. Deep Constrained Clustering (DCC) is a relatively recent offspring of the Deep Clustering area. An example of a problem which relies on constrained clustering but cannot be easily solved with conventional methods is automatic animal re-identification in videos and images. Monitoring of groups and herds of animals, laboratory animals, and livestock may generate extensive footage. Identifying individual animals to study their movement and other behaviours requires individual animal identification from scarcely labelled data. The PhD project is planned as a step towards better DCC as an advanced tool for semi-supervised clustering and classification.

PhD Title: Learning from Badly Behaving Data (T3)
Hobbies/Interests: outdoors, history, gaming, and sci-fi

Name: Natalia Sikora
University: Swansea

Research area: My project is focused on diagnosing bowel cancer from biofluids, utilizing Raman spectrophotometry, multiple machine learning techniques and their applications in particle detectors. I aim to improve our algorithm to allow accurate classification models. The samples we currently receive are provided by rapid diagnostic clinics, therefore we aim to incorporate the information from patient's medical record. The ALPHA Antihydrogen experiment makes use of several particle detector technologies, including a Silicon Vertex Detector. Time Projection Chamber, and a barrel of scintillating bars. These detector systems are challenging when it comes is to distinguishing between antihydrogen annihilation and cosmic rays. Presently, a common technique to resolve this is a use of cuts based on two high-level variables from the detectors for online analysis, and boosted decision trees with high-level variables in offline analysis. High-level variables are a powerful tool for discrimination, nonetheless slow to pre-process. We aim to build both online and offline analyses that have different processing budgets. Subsequently, we will aim at reducing pre-processing time by replacing the high-level variables with lower-level variables. We hope to create a small enough model that can interpret raw detector output to enable a real-time online analysis, with the ultimate objective of programming an FPGA or micro-controller to perform accurate, real-time classification of detector events.
PhD Title: Enhancing the diagnostic performance of a bowel cancer blood test using advanced machine learning algorithms and the incorporation of information from the patient's medical record (T2)
Hobbies/Interests: I enjoy oil painting, literature, history of art, and music - I used to play a double bass in a jazz band. I also try to stay active whenever possible. My sport interests involve yoga, hiking, horse riding, and martial arts - particularly kickboxing and Krav Maga. I am a keep biker, owning a motorcycle in my home country, I often arrange motorcycle trips to our treasured national parks.

Name: Matt Selwood
University: University of Bristol

Research Area: Euclid is a European Space Agency (ESA) M-class mission, aiming to uncover the nature of the Dark Universe. This space telescope will map the majority of the extra-Galactic sky (15,000 sq. deg.) in the optical and near infrared bands with excellent spatial resolution. The combined data of Euclid and ground observations e.g., with the

Large Synoptic Survey Telescope (LSST), will form possibly the largest astronomical dataset of the next decade with 10 billion detected sources. My PhD project pertains to the preparation and exploitation of Euclid data. In anticipation of the Euclid launch (~2022), I will work with currently existing public large datasets, focussing on source classification with machine-learning methods, and AGN/galaxy coevolution studies.
PhD Title: Using Machine Learning to Explore the Evolution of Active Galaxies with Euclid (T1)
Hobbies/Interests: I enjoy mountain biking and am a keen cricketer. Outside of sports I produce music and love a camping trip.

Name: Ben Page
University: Swansea (SURES)

Research area: I am currently studying QCD and split my time between two key areas: spectral reconstruction of non-relativistic bottomonium meson states using the Backus-Gilbert method, and the search for a numerically stable approach to simulating QCD at finite chemical potential.
PhD title: Studies of Thermal QCD via Lattice Gauge Theories (T1)
Hobbies/Interests: I enjoy amateur astronomy/astrophotography and learning different languages. In my spare time, I play piano and restore a 1965 Ford Anglia (Ron Weasley's car, for any Harry Potter fans).

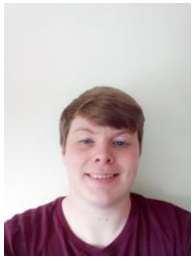
Name: Matthew Walker
University: Cardiff

Research area: EEG (electroencephalography) measurements have been shown to be more accurate when data about the anisotropy of the white matter in the brain is provided. This data can be obtained by Diffusion Tensor Imaging in the brain using Diffusion MRI. However, this diffusion tensor data is costly and time consuming to obtain. This project involves using machine learning methods to infer the diffusion tensor data from standard structural MRI images.
PhD title: Inferring brain tissue microstructure from standard structural imaging (T2)
Hobbies/interests: Triathlon, trail running, trance music, travel, mountains.

Name: Jake Amey
University: University of Bristol
Research Area: Particle Physics
PhD Title: Amplitude analyses of multibody B-hadron decays and the implementation of hardware acceleration techniques with the LHCb experiment (T1)
Hobbies/Interests: Music, arthouse movies, playing guitar.

Name: Sam Wincott
University: Cardiff University
Research area: Neuroevolution and reinforcement learning
PhD title: Open-ended generation of environments and tasks for reinforcement learning agents (T3)
Hobbies/Interests: I enjoy cooking and gardening in my spare time

Name: Jacob Elford
University: Cardiff University
Research area: Astrophysics
PhD Title: Monsters in the dark: gas, dust and star formation around supermassive black holes (T1)
Hobbies/Interests: Football, Poker, Computer Games



Name: Drew Barratt
University: Cardiff University
Research area: Computational virology, bioinformatics and disease modelling.
I will be merging the vast repository of SARS-CoV-2 genome sequences from COG-UK, with the SAIL database which contains a range of patient information and outcomes. From this, I will determine whether there are any specific changes within the SARS-CoV-2 that are associated with worse patient outcomes (virulence) or a change in its transmissibility.
PhD Title: Examination of SARS-CoV-2 severity, transmissibility and spread within Wales through the analysis of linked patient health records and genomic sequence data (T2)
Hobbies/Interests: I have previously worked in the realm of diagnostic microbiology and continue to have a strong interest in infectious disease. Outside of academia, I enjoy swimming, mountain biking and live music.

Name: Bishnu Paudel
University: Aberystwyth

Research area: Stroke can manifest itself differently in different people. Some forms of rehabilitation are more effective and practical in some people and vice-versa in others. The aim of the project is to reliably connect the form of stroke detected from Magnetic Resonance Imaging(MRI) scans with gait impairments and to monitor the impact of interventions in real time. I am currently focused on developing a model to automatically segment stroke lesions in publicly available datasets.
PhD Title: Use of Artificial Intelligence in Stroke Recovery Prediction (T2)
Hobbies/Interests: Chess, Table tennis, Philosophy, Fiction

Name: Luke Lunn
University: Aberystwyth

Research Area: Computer Vision and Space Robotics: Generating colour images of Mars from non-colour filters using machine learning and computer vision, when resources or time cannot allow for a colour photograph.0
PhD Title: Generating the True Colour of Mars (T1, T3)
Hobbies and Interests: Flight, Space, Guitar, Climbing, Gaming, Fantasy Literature, D&D

Name: Iwan Mitchell
University: Bangor

Research area: Investigating how to automate the parametrisation of non-destructive testing with Computerised Tomography for customised components. High Performance computing will be used to scan and tune multidimensional parameters, which is challenging using today's algorithms.
PhD Title: Automated optimisation of industrial X-ray Computed Tomography (T3)
Hobbies/Interests: Often found reading fantasy novels and enjoying games with friends. Also, an avid collector of music.

Conferences, papers and projects

Tonicha Crook

2nd year AIMLAC student Tonicha has continued to present her research at conferences, in which she previously spoke at BCTCS about 'The Weihrauch degree of finding Nash equilibria in Multiplayer Games'. A similar presentation was then conduced at CiE (Computability in Europe) but with more focus on computability. At CCC (Continuity, Computability, Constructivity) she took part in another informal presentation, this time going into detail over finding the roots of polynomials, as when restricting ourselves to just finding real roots the problem becomes incomputable which is an important section of her research.

She wrote and taught an introduction to Game Theory lecture for ELTS at Swansea. This is the English Language Training Service, they help non-English speakers make sure they can understand scientific lectures in English, before they start a degree in the UK. This was for a class of around 30 students.

Tonicha also got asked to talk for 50 minutes giving an Introduction to Weihrauch Reducibility and her research for the University of Wisconsin-Madison logic student seminar. This talk takes place via Zoom on 24th November 2020.

Sophie Sadler

2nd year AIMLAC student Sophie Sadler has recently been appointed as this year's Science and Research Editor for the Swansea student newspaper, the Waterfront. In this role she will be responsible for writing and commissioning articles on a range of topics, including highlighting science news and bringing attention to the achievements of the Swansea University research committee. News pieces already published in this role include an interview with the Student Union's Education Officer, Theresa Ogbekhiulu, for Black History Month.

Monthly issues of the newspaper are available here: https://issuu.com/thewaterfront while a selection of articles are also published on the Swansea Student Media website: http://www.swanseastudentmedia.com/waterfront/

Tom Spriggs

2nd year DI student Tom Spriggs reports: I first heard about the Europa HPC3 scheme through a computer science mailing list that I had signed up for; I frequently get annoyed at endless useless e-mails, but I found my needle in this haystack. The scheme offers a fully funded opportunity to develop skills and research in a field related to high performance computing (HPC) at one of countless universities across Europe. I study theoretical particle physics, more specifically lattice gauge theory, and have huge overlap with maths and computer science in my research and used this as an excuse to apply and try and learn something new: how to get a free trip to Dublin for 13 weeks.

The application was simple enough, a short project proposal and a few details about my computing background, luckily, I had some events run by the AIMLAC CDT to lean on for this part, however, one source of training is bound never to be enough and this was the case here too. 'HPC skills' here meant C, C++, FORTRAN, OpenMP, MPI, and frankly not too much more. There's a lot to be said for the higher-level skills like cloud computing, fancy techniques in higher level languages, and experience with machine learning techniques (which I have too, in case there's any employers out there), but in the list of skills for this application they would have gone under 'other skills' as they cover only a small fraction of the HPC landscape. Luckily, I had learned C, C++, and OpenMP as part of my research, and gave a hard "no" to FORTRAN (until I caved under the overwhelming amount of physics codes that use it, and learned FORTRAN 95), so these allowed me to appear like a strong candidate for not much extra work.

But I didn't succeed the first time. What I did do though, was receive really thorough feedback, and when I replied to thank them for such helpful words of where to improve, I was given even more. Again, to my fortune, there was another round of applications coming up and I put what I had been told to use (my problem was in the lack of novelty in my project proposal). I reapplied and got it.

And so, Covid dependent, I will be heading to study at Trinity College Dublin for 13 weeks in the new year. I would also encourage anyone to find any chance to do something similar.

Equality, Diversity and inclusion

The DI CDT and AIMLAC have formed a collaborative EDI committee to share best practice, knowledge and promote and pursue EDI issues.
EDI will be a running section in our newsletters, and we are planning regular EDI sessions at our training events.

Roberta Chiovoloni, the current EDI Chair for the committee shared some of the missions of the newly formed committee:

The EDI committee shall ensure that there is an integrated, proactive approach to equality, diversity and inclusion for all the members of the CDT-DI -AIMLAC cohort. All CDT-DI-AIMLAC events, training opportunities and seminars respect EDI standards and ideas. The recruitment messages and materials promotes the cohort as an inclusive environment. The committee will also provide training possibilities to the CDT-DI-AIMLAC members during some of the cohort's events.
During the training, experts in the fields will provide insight on EDI matters and raise awareness around the topic.

The committee is currently in the early stages of an outreach project. The committee hope to explore and integrate with current outreach initiatives within Universities linked to the CDT and educate and inform communities about the CDT to encourage a diverse and inclusive future.

Industry placements

Thank you to all our CDT partners for supporting 6-month placements for our now 2nd year cohort.

Partner	Project lead	Students
Agxio	Dave Gregory	Cory Thomas
Amplyfi	Lorenzo Bongiovanni	Tom Spriggs
Mobileum	Nick Jones	Robbie Webbe
Hywel Dda University Health Board	Eirini Skiaderesi	Bradley Ward
UKRI - STFC	Keith Butler	Lily Major
UKRI - STFC	Jola Mirecka	Ben Winter
UKRI - STFC x 2	Jeyan Thiyagalingam	Hattie Stewart & Michael Norman
UKRI - STFC	Agnel Joseph	Sophie Sadler
UKRI - STFC	Martyn Winn	Chris Wright
GCHQ and the Heilbronn Institute	Sandra W	Jamie Duell
GCHQ and the Heilbronn Institute	Sandra W	Vanessa Cassidy
GCHQ and the Heilbronn Institute	Sandra W	Tonicha Crook
EDF energy	Hannah Loebl	Raul Stein
We predict	Patrick Tudor	Eleanora Parrag

Contact

If you are interested in hosting a placement, or if you would like to know more about our industry placement process, and have a project in mind for a student, please get in touch with us at cdt-aimlac@swansea.ac.uk

Rhian Melita Morris - CDT Centre Manager (Swansea) r.m.morris@swansea.ac.uk
Mrs Roz Toft - CDT Research Support Officer (Swansea) r.toft@swansea.ac.uk

External partners

The CDT works with a range of external partners, some examples are below. If you are not on the list and would like to work with and support us, please contact us at aimlac-cdt@swansea.ac.uk