



UKRI CENTRE FOR DOCTORAL TRAINING
IN ARTIFICIAL INTELLIGENCE, MACHINE
LEARNING AND ADVANCED COMPUTING

WINTER-SPRING 2022-23

cdt-aimlac.org/ @AimlaCommunity



PROFESSOR GERT AARTS DIRECTOR OF AIMLAC

Dear all,
We are now well into the fourth year of AIMLAC, with over 50 students enrolled in AIMLAC and the Data-Intensive CDT.

Even more, at the end of this academic year, the first cohort will graduate (fingers crossed!). Recruitment for the 5th cohort is underway and we hope to recruit slightly more students than usual.

The past year has been busy, with our first AI conference in June, attended by over 50 participants from AIMLAC, industry and other partners.

Two international trips added new experiences: In March 2022 a delegation of 14 researchers visited the Institute in AI and Fundamental Interactions, IAIFI, at MIT, using support provided by EPSRC. IAIFI has a similar crossdisciplinary structure as AIMLAC, but also includes postdoctoral researchers. In November 2022, 12 researchers spent a week in Seoul, on an exchange programme funded by the National Research Foundation of Korea, the British Embassy Seoul, and the UK Science & Innovation Network.

I think I can speak for all us who went on the trip that the 14-hour flight was totally worth it. Placements at partners are continuing well, and as always we are grateful for the opportunities provided. We know for sure AIMLAC is making waves, as I was interviewed recently for BBC Radio Wales Science Cafe to talk about AI and AIMLAC. Even quantum machine learning made an appearance. The programme will be first broadcast on Valentine's Day at 18:30 and can then be found on BBC Sounds.

Finally, it is a great pleasure to welcome Barbara Usher, who is working alongside Roz (and Rhian and Rosemary) to make everything happen without me even realising.

I am looking forward to the next event to meet everyone in person.

Gert

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FROM OUR STUDENTS

WINNERS OF MOZILLA'S OUR VOICE COMPETITION

Preben Vangberg and Leena Farhat are developing speech-to-text models to build voice assistant applications and voice-enabled chatbots for the Swiss language Romansh.

Despite Romansh being one of the official languages, barely 0.5% of Swiss residents (about 60,000 individuals) declared Romansh as one of their official languages in 2013. By teaching bots to speak — The duo hopes to create a cultural shift where the language becomes an integral part of day-to-day interaction.

"Language is part of people's culture. And working towards making a cultural shift requires certain tools and infrastructure. Our starting point is creating a speech-to-text framework for Romansh and its dialects. That on its own is revolutionary, as this is one of the pioneering projects to do so," says Farhat.

While most people in Switzerland are multilingual, speaking at least another official language (French, German, or Italian), Romansh can be considered a regional language, primarily spoken in the canton of Graubünden, with five dialects: Sursilvan, Sutsilvan, Surmiran, Putèr and Vallader — Two of which are available in the Common Voice data corpus, Sursilvan and Vallader.

Due to limited resources available in the language, for instance, audio records and text, Vangberg and Farhat mainly focused on training their model using text. The team sourced old Swiss newspapers dating back from 1997 until the present to build their text archive. "We wanted to do the most with the public data available," says Vangberg.

With a character error rate of 7.5%, transcription applications using their model would be accurate at converting audio into text with minimal errors, with 0% indicating a correct transcription.



Preben Vangberg and Leena Farhat, one of the winning teams from Mozilla's Common Voice, 'Our Voice' competition.

"Our goal is to continue training and improving the accuracy levels so that anybody can seamlessly use and build applications using our model. The common voice dataset has been very valuable in giving us a head start," concludes Vangberg. Choosing to focus on minority languages as the scope of their research has been immensely rewarding, says Farhat, "this is because the challenges are unique — you can't compare training a model with a vast data set like that of English and that of a low resource language like Romansh — finding solutions to obtain good results despite the limitations is what makes this work interesting! And the societal impact is even more significant!"



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AIMLAC RECRUITMENT



Our recruitment cycle has now closed for our final cohort and we are now going through the process of shortlisting. We are looking forward to welcoming our new students later on in the year when they join AIMLAC in September.

STAFF NEWS

We are delighted to welcome Julian Lenz as a new Research Software Engineer on AIMLAC. He will work alongside Ed Bennett at AIMLAC events supporting our students through our training program.

He joins us from the University of Jena where his research focused on quantum matter under extreme conditions that may be found within neutron stars or in the early universe.

When he's not teaching software skills, he is supporting his research community in becoming more open and fair to further encourage and foster collaborative scientific achievements.

Julian has been with AIMLAC for 8 months and one of the things he's enjoyed most so far is getting around Wales and England and meeting new people in our series of training workshops.

We're glad to have Julian join the team of RSE's, he's already such an asset to AIMLAC and a support to our students.

As we say hello to one research software engineer, we are sadly saying goodbye to another. Colin has been the cornerstone of the Supercomputing Wales RSE team from the beginning of the project.

He has, at times single-handedly, supported the entire computational research community at Aberystwyth. He has partnered with the other RSE's in delivering training and development to all four cohorts of AIMLAC students and associated students. We're grateful for all his hard work and support over the years and we wish him well on his next endeavor.

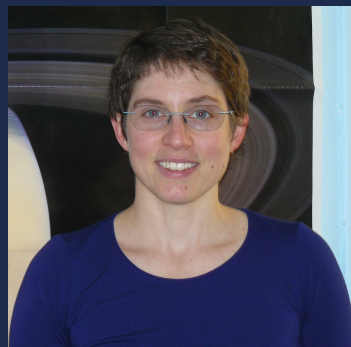
Colin is excited to be taking up a new role as Senior RSE at the National Oceanography Centre from January 2023.



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NEW BOARD MEMBERS



Dr Zoe Leinhardt is an Associate Professor in the school of Physics at the University of Bristol has recently joined the AIMLAC Management Board. Zoe specializes in Computational astrophysics specifically on Planet formation.

Zoe leads on the Astrophysics theme group working with a team of 40 members.

Dr Ivonne Zavala has joined the broader management board. Ivonne is a faculty member of Physics Department and the Particle Physics and Cosmology Theory (PPCT) group. She is interested in a wide range of fundamental questions

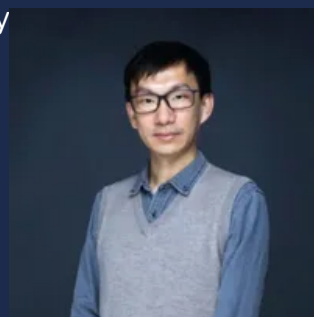


at the interface between cosmology and particle physics. In particular understanding the nature and origin of past and present acceleration, i.e. cosmological inflation and dark energy, as well as the nature of dark matter, in terms of a fundamental theory of quantum gravity such as string theory. Ivonne obtained her PhD and master's degrees from the University of Cambridge, UK. She worked as an STFC postdoctoral fellow at the University of Durham, followed by research positions at the Universities of Bonn and Groningen before joining Swansea in 2014.

A complete list of Ivonne's publications can be found here. She is a fellow of the Higher Education Academy (HEA).

STAFF NEWS

Dr Scott Yang has recently joined AIMLAC as a new student supervisor. He previously was a Senior Research Associate in the Intelligent Systems Research Centre, Ulster University before joining Swansea as a lecturer in the Computer Science Department. His key areas of expertise are in Pattern recognition, Artificial Intelligence, Machine Learning, Data Analytics and Biometrics.



STUDENT BOARD



Tabitha Lewis - Chairperson
Rhys Shaw - Deputy chairperson
Sophie Sadler - Co-Chair of the CDT Student Board
Frank Krzyzowski - Co-Chair of the CDT Student Board
Thomas Spriggs - Student Representative for CDT and Swansea University CDT Governance group

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UPCOMING EVENTS - AI CONFERENCE 2023



June Conference 2022

Doctoral researchers and academics linked to two Centres of Doctoral Training (CDT) in Artificial Intelligence (AI) and Data Science will come together to share ideas at the Artificial Intelligence Conference on 5-6th June 2023.

Swansea University will host the conference joined by our CDT partner universities; Aberystwyth University, Bangor University, Bristol University and Cardiff University.



Being a part of the organising team has been such a unique and positive experience. Not only did it help me develop my skills, but witnessing attendees enjoying the event, made all the hard work worth it.

Tabitha Lewis

This is a free two-day event, at Swansea University's Computational Foundry, bringing together doctoral researchers, supervisors, Research Council and commercial partners associated with the UK Research and Innovation (UKRI) CDT in AI, Machine Learning and Advanced Computing (AIMLAC) and the Science and Technology Facilities Council (STFC) CDT in Data-Intensive Science.



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UPCOMING EVENTS

DataAid

Doing Data Science for
Charitable Organisations

13-14TH MARCH 2023

DataAid is our student driven programme which unites the analytical skills and expertise of PhD students in the Data Intensive CDT and the AIMLAC CDT with charities in need of data support to generate valuable new insights and perspectives on the data they hold. The DataAid programme runs two-day events attended by the CDT student cohorts and charity partners. The next event is to take place at Cardiff.

CARERS
TRUST

GO
BEYOND

THE
DIANA
AWARD

sericc
Rape and Sexual Abuse
Specialist Service

CHANCE TO SHINE
Spreading the power of cricket

FAIRTRADE

Charities we've worked with

We are glad to be part of the DataAid event. We have big and rich data but we do not have enough expertise nor the time to examine our data in detail. At the end of this event, we received very valuable analyses and findings which will support some of our narratives in funding applications or our communication to wider audiences. Overall, we had a very positive experience and rewarding findings." - Charity Representative, Chance to Shine

“It was amazing being able to apply what we have learned in university and being able to help charities! Not only did we improve our current skills, it also developed our leadership, organisation and communication skills. - AIMLAC student”



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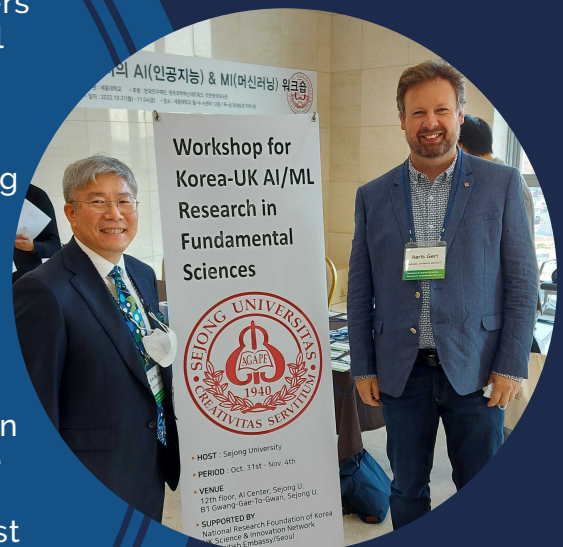
PAST EVENTS



SEOUL 2022

A joint UK-Korean workshop entitled Artificial Intelligence & Machine Learning for Fundamental Science, took 11 researchers associated to the UKRI Centre for Doctoral Training in Artificial Intelligence, Machine Learning and Advanced Computing (AIMLAC), to Seoul, for a week-long exchange on research in and applications of machine learning in South Korea's capital. The meeting, co-organised by Professor Seyong Kim, of Sejong University, and Swansea's Professor Gert Aarts, Director of AIMLAC, was opened by Gareth Davies, the (Welsh-born!) Head of Science and Innovation at the British Embassy Seoul. Supported by the National Research Foundation of Korea, the UK Science & Innovation Network, and British Embassy Seoul, the meeting was the third event in a series, starting with a virtual meeting in November 2021, followed by a visit of Korean colleagues to Swansea during the annual AIMLAC Conference (June 23-24 2022).

Besides the scientific exchanges, on topics ranging from breast cancer to gravitational waves and from anti-hydrogen to hypergames, a cultural highlight was the conference banquet, taking place inside the National Museum of Korea.



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PAST EVENTS



MASSACHUSETTS 2022

PhD students from Swansea University have been sharing their cutting-edge research into artificial intelligence with colleagues in America.

A group of 12 PhD students and two Faculty members of Swansea's UKRI Centre for Doctoral Training in Artificial Intelligence, Machine Learning and Advanced Computing (AIMLAC) visited the Massachusetts Institute of Technology (MIT). The group exchanged ideas on the application of AI and Machine Learning (ML) in scientific research as well as on the education and training of the next generation of data science/ML leaders. The delegation, led by CDT Director Professor Gert Aarts of the Physics Department, and CDT Technical Director Professor Biagio Lucini, from the Mathematics Department, visited the Institute for Artificial Intelligence and Fundamental Interactions (IAIFI).

Hosted by Professor Jesse Thaler and Dr Phiala Shanahan, the students - six from Swansea and two each from Bangor, Bristol and Cardiff universities - presented their research in two longer talks and 10 flash talks.

IAIFI Fellows then gave the same number of talks which resulted in stimulating discussions during the social events afterwards.

A special session was devoted to the training programmes of AIMLAC and IAIFI, including an AIMLAC presentation on student placements at industry partners.

The visit was made possible by EPSRC funding specifically devoted to enable collaborative activities between AI researchers in the UK and the USA.



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EQUITY, 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 a section in our newsletters, and we are planning regular EDI sessions at our training events.

Our most recent cohort received EDI training delivered by Theresa Obekhiulu followed by a meeting chaired by Biagio Lucini where our students can voice the changes they would to see and input into future AIMLAC events.

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 hopes 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.

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OUR PARTNERS



The CDT works with a range of external partners. Opportunities include shaping the CDT, access to the next generation of experts in the field, and support in developing projects.

INDUSTRY PLACEMENTS

Thank you to our CDT partners for supporting 6-month placements for our now 3rd year cohort. All our 2021 students have been matched with placements at the following industrial partners: Infinitesima, STFC, Rothamsted Research, DiRAC, GCHQ, Amplyfi, Agxio, Office National Statistics and some have already started their 6-month project. The next round of placement matching will begin at the Induction event 19th to 21st September. Please save this date in your diary, this event promises great talks, networking opportunities, and more about how you can get involved in hosting a student placement. Links to talks and resources on the website.

CONTACT US

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 :

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Previous newsletters are available on the AIMLAC website

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MEET THE MANAGEMENT BOARD

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



Prof Gert Aarts -
CDT Director
(Swansea, physics)



Prof Biagio Lucini
- CDT Technical
Director,
Swansea



Prof Reyer
Zwiggelaar,
Aberystwyth



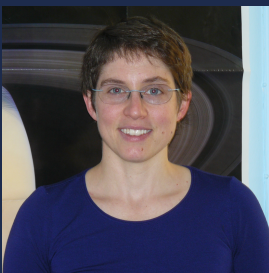
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Barbara Usher -
CDT Support
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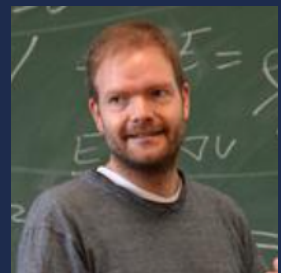
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Prof Sinead
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Swansea



Dr Ed Bennett
(Supercomputing
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