

Centre for Doctoral Training  
in Applied Photonics

# Newsletter

September 2015

[www.cdtphotonics.hw.ac.uk](http://www.cdtphotonics.hw.ac.uk)



**Prof. Derryck T. Reid**

Director, EPSRC Centre  
For Doctoral Training in  
Applied Photonics

Welcome to the September Edition of the CDT Applied Photonics newsletter. I am delighted to introduce here the newest cohort of research engineers to join the centre, who began courses at St Andrews in early September. Some of our more senior research engineers will already be formally engaged as mentors to this cohort, and in this capacity I'd encourage you to extend a welcome to your new colleagues.

During the last six months we have been developing plans for our first CDT Applied Photonics Summer School (more in this newsletter). We have also held the first meeting of our independent advisory committee, who provide an external and largely international perspective that feeds into our future strategy for the Centre.

In response to a suggestion of promoting good practice in the Centre we established two "good practice ambassadors", Chris Dickson and Marcus Ardron. In this edition you can read the first article, in which Chris shares his perspective on how to successfully navigate the EngD programme.

Finally, let me introduce and welcome the newest member of our executive team, Ms. Colette Bush, who is providing temporary cover for Mrs. Linda Bruce while she is on medical leave. I'm sure you will join me in wishing Linda a speedy recovery, and we look forward to her returning in mid-November.

*Best wishes,*

**Derryck**

## Welcome Event

A welcome event for our new Research Engineers took place in September. Centre Director Prof. Derryck Reid, Dr. Bill MacPherson (Deputy Director), Dr. Dawn Beddard (Academic Manager) and second year student Russell Gordon gave talks at the event.



**Anna Michalska**  
*Renishaw – Heriot Watt University*



**Gabriel Reines March**  
*NHS Greater Glasgow & Clyde  
– Strathclyde University*



**Jack Thomas**  
*Fraunhofer – St. Andrews*



**Jonathan Crabb**  
*Gooch & Housego  
– Strathclyde University*



**Matthew Daykin**  
*Toshiba Medical Visualization Systems  
– Heriot Watt University*



**Michael Reilly**  
*Selex ES  
– Heriot Watt University*



**Munadi Ahmad**  
*STFC – Heriot-Watt University*



**Neil Stevenson**  
*Fraunhofer – St. Andrews*



**Riccardo Geremia**  
*Oxford Lasers – Heriot-Watt University*



**Tom Dyer**  
*AWE – Heriot-Watt University*



**Vladimirs Horjkovs**  
*Taylor Hobson – Heriot-Watt University*



## Dr. Christopher Dickson *Good Practice Ambassador*

**EngD Good Practice Ambassador Chris Dickson shares his perspective on how to successfully navigate the EngD programme.**

“Having started my Engineering Doctorate with Thales in September 2010, I was able to successfully submit the first draft of my thesis almost exactly four years later.

Part of the process of an EngD is documenting plans which outline what will be completed when over a certain period of time (a quarter, a year, or even the full length of the EngD). I found that once an outline of work, or a prediction of the direction of future research, was committed to paper it became out-of-date and even obsolete almost immediately. However, I found that the process of thinking through an extended period of work – documenting what had been accomplished and what was outstanding - helped me focus and provided a clear benchmark of what work was left to finish.

Looking back at the Annual Project Reviews I completed every summer emphasises exactly how much the “intended” route of my project changed over the four years of my EngD. The basic premise of my research (to improve the understanding of scenes based on imagery obtained from a moving camera) remained the same. However, from an

initial focus on Structure from Motion, through multi-modal (Visible + NIR + LWIR) vehicle detection, to my final thesis on vehicle detection using Polarimetric LWIR imagery, the route certainly couldn't be described as straight!

Once every three months my two industrial supervisors, Barry Connor & Matt Kitchin from Thales, my academic supervisor, Andrew Wallace from Heriot Watt University and myself would gather for a half-day discussion. Although these meetings are now formally labelled as Quarterly Reviews and the notes requested by the EngD centre, I felt that these semi-regular meetings were very beneficial even before they became mandatory.

Our meetings would start with a brief summary of activity over the last three months, including any courses or conferences I had attended. Following this they could easily transition into discussions on minute details surrounding the implementation of some method or the process for analysing data, or more abstract hypotheses considering possible parallel applications to my project within Thales. Trying to manage these discussions could be difficult, and the meetings were often very tiring, however the outcome of

a good meeting would be a fresh sense of direction and inspiration for the next stage of the project.

When it came to writing my thesis I felt that creating a structure early was important. I had probably written the contents page, and had started populating some of the theory sections around twelve months before I intended to submit. I believe that started this process early reduced the psychological barrier to writing such a large document, and helped relieve some of the pressure closer to the deadline when my attention was drawn to completing and writing up the final experiments.

In summary I would say that it is often the process of writing the plan, rather than the finished plan, that is most useful. Indeed, planning research activities, where the outcome is uncertain, can be difficult, but planning a suitable thesis structure should be simpler. I cannot recommend enough the advantages of agreeing a structure early in the process, and collating work as you completed it to form the initial content for each chapter, as this only makes things easier in the long run when you become more keen to finish.”

# Systems Engineering and CAD Modelling Workshop

A Systems Engineering workshop based at Heriot-Watt University took place on 27th and 28th June 2015. The Research Engineers worked in groups to design remote control buggies, printing the parts with a 3D printer. Some of the comments about the workshop were:

*"Fun way to practice mechanical and electrical design"*

*"It was really useful to learn to work in a team with different skills"*

*"Great to be taught CREO then make my own parts and get them 3D printed"*



## Alumni Update

EngD alumni Dr. Suzanne Costello has become the first woman to be elected chair of the UK chapter of the International Microelectronics Assembly and Packing Society (IMAPS).

Dr. Costello studied for both her Physics undergraduate degree and her Engineering Doctorate at Heriot-Watt and is now a Senior Development Scientist at MCS Ltd, solving materials, manufacturing and reliability problems for the electronics industry.

## Viva Success

Very many congratulations to the following Research Engineers who have recently had a successful viva.

**Marcus Ardron**  
**Ben Fulford**  
**Will Cochrane**  
**Michael Leach**  
**Mickey Crozier**

**Eoin Murphy**  
**Oliver Daniell**  
**Mathieu Rayer**  
**Daniel Drysdale**



## CDT in Applied Photonics Conference 2015

The Centre for Doctoral Training in Applied Photonics conference took place on 26 June 2015 with around 100 delegates attending. Research engineers in their first year prepared a group poster based on the Systems Engineering projects that they had been working on at Strathclyde University. The Group prize winners were Jamie Coyle, Calum Hill and Russell Gordon. The second year research engineers prepared a poster and also gave a one minute pitch on their poster. The winner of the Best Poster prize was James Morris. The third year research engineers gave a presentation and the winner of the Best Presentation prize was David Webb. Invited speakers were Prof. Harold Hass, Chair of Mobile Communications at the University of Edinburgh, Dr. Alex Ward of Razorbill Instruments, and Dr. Stephen Webster of M Squared Lasers.



## Conference and Summer School 2016

The CDT in Applied Photonics annual conference will be held at the School of Physics and Astronomy, St Andrews on 24th June 2016.

The first CDT in Applied Photonics 2016 Summer School entitled 'Photonic Systems for Sensing and Metrology' will be held in St Andrews from 25th June to 1st July 2016.