Job Description – Image Sensor Design and Test Engineer, Centre for Electronic Imaging

The Role

The Centre for Electronics Imaging (CEI) is a research centre within the School of Physical Sciences at the Open University. The CEI is a collaboration between the Open University and Teledyne e2v, a world-leading manufacturer of scientific and industrial image sensors. The CEI is dedicated to conducting research into advanced imaging technologies for science applications and provides knowledge exchange between UK industry and academia.

This post is intended to increase our capabilities in CMOS image sensor design and characterisation, and to help develop new devices for scientific imaging and space applications. The post holder will be engaged in all aspects of the design, modelling, simulation and layout of new CMOS image sensors, their characterisation, interfacing with team members, external engineers and semiconductor foundries, and dissemination of the results of the research. The role requires a high level of creativity and innovation in support of the OUs work and research into space and solar system exploration.

Key responsibilities – (focus on some points will be based on strengths, skills and experience)

- Design, simulation and layout of CMOS image sensors using Cadence tools;
- TCAD semiconductor device simulations of image sensors at pixel level;
- Perform laboratory characterisation of CMOS image sensors;
- Specify and develop hardware and software to support sensor characterisation;
- Create and maintain technical documentation relating to sensor design;
- Ensure outcomes are appropriately reported and disseminated as the work progresses, including the writing of content for research publications and presenting at conferences and workshops internally and externally;
- Work with the Professor of Electro-Optics and Senior Research Fellow in the writing of project proposals and funding applications, providing advice on issues relating to image sensor design;
- Promote knowledge and technology exchange with Teledyne e2v.

While experience in the above areas is welcome, opportunities will be provided to the successful applicant to develop through formal and informal training.
Person Specification

Skills and experience

**Essential:**
- BSc or equivalent qualification in electronic engineering or a related subject;
- An excellent understanding of semiconductor physics and electronics;
- Demonstrable organisational, planning and problem-solving skills, including ability to anticipate and analyse problems and introduce workable solutions;
- Proven ability and capacity to adapt quickly, flexibly and effectively to change;
- Good verbal and written communicating skills;
- Demonstrable ability to work as part of a team and on own initiative;
- Able to present to a wide range of audiences;
- Excellent work ethics and attention to detail;
- Experience of project management.

**Desirable:**
- MSc or PhD in electronic engineering or a related subject;
- CMOS image sensor and IC design;
- Proficiency with Cadence Virtuoso/Spectre design tools;
- TCAD semiconductor device simulations;
- Software development and data analysis.
About the Centre for Electronic Imaging

The Open University has over 30 years of experience leading science and instrumentation development for space missions and hosts the UK’s third largest space science and instrumentation research group. This enables leading roles for OU researchers within international space mission consortia. Past highlights include the Gas Analysis Package (GAP) on Beagle 2, the Ptolemy instrument on the Rosetta mission, the NOMAD instrument on ExoMars TGO and the detectors for Gaia with future significant involvement in Euclid, JUICE, Athena, SMILE and WFIRST and the Russian Luna-27 moon lander with ESA’s PROSPECT instrument suite. The space instrumentation research and development are underpinned by a world leading team of space science researchers and instrument technology development which is delivered through collaboration with universities, space agencies (e.g. UKSA, ESA, NASA, JAXA etc.) and companies worldwide.

Electronic imaging research at The Open University is spearheaded by The Centre for Electronic Imaging (CEI), a collaboration between The Open University and Teledyne e2v. The CEI is a research group of over 25 scientists and PhD students and its members have been, and are, involved in many international space missions including XMM-Newton, Chandra, Swift, GAIA, Chandrayaan-1 and 2, UKube-1, Euclid, AlSat-Nano, JUICE, Athena, SMILE and WFIRST. The CEI is dedicated to the research and development of advanced technologies for electronic image sensing and provides knowledge exchange and training between UK high-tech industry and academia.

The work of the CEI is to perform basic and applied research into silicon imaging sensors (Charge Coupled Devices – CCDs and Complementary Metal Oxide Semiconductors – CMOS). This research follows several key themes:

- Modelling, including 3D device simulation, of new structures within imaging sensor technology;
- Design of new imaging sensors, with contributions to the design work at Teledyne e2v;
- Development of new test methodologies and new fundamental understanding of the physical processes at work within image sensors;
- The study of space radiation damage on the sensors, and its impact on the scientific performance of instruments using the technology;
- This fundamental research is applied by the group for many high-performance imaging instruments for applications including space (and ground-based) astronomy, planetary and solar system science, solar and terrestrial physics, Earth observation and ground-based synchrotron applications.

The CEI is committed to building an inclusive research environment. The Group supports flexible working arrangements, within the limits of the post, and particularly welcomes applications from groups traditionally under-represented in STEM.
About the Unit

Faculty of Science, Technology, Engineering & Mathematics

The Faculty of Science, Technology, Engineering and Mathematics (STEM) is comprised:

- School of Computing & Communications
- School of Environment, Earth & Ecosystem Sciences
- School of Engineering & Innovation
- School of Life, Health & Chemical Sciences
- School of Mathematics & Statistics
- School of Physical Sciences
- Knowledge Media Institute
- Deanery including teams supporting Curriculum, Research and Enterprise, Laboratory Infrastructure and Faculty Administration

“We aspire to be world leaders in inclusive, innovative and high impact STEM teaching and research, equipping learners, employers and society with the capabilities to meet tomorrow’s challenges”

The Faculty of STEM consists of 2500 staff including 1,800 Associate Lecturers. The Faculty delivers over 185 modules across undergraduate and postgraduate curriculum, supporting nearly 19,000 students (full time equivalents) which is 29% of the OU total.

The Faculty generates more research income (circa £17M) than any other Faculty in the University, supported by a comprehensive laboratory infrastructure.

We are proud of our distinctive values and capabilities underpinning our aspiration:

We are inclusive:
- We transform people’s lives, ensuring STEM education is openly accessible to many thousands of students from diverse backgrounds – our students express high satisfaction with their study experience.
- We engage the public in exciting citizen science and engineering, including through free open educational resources, multi-platform broadcasting, outreach to inspire the next generation and with programmes to encourage more women into STEM.

We are highly innovative:
- We are at the forefront of innovative developments in teaching practical science and engineering at a distance, through simulated and remote access laboratories and practical experimentation.
- Our high-quality teaching and curriculum are informed by world-leading research, strong links with professional bodies and communities of practitioners, as well as by scholarship focused on continuously improving our STEM pedagogy.

We deliver significant social and economic impact:
- We provide STEM higher education at a scale and reach unsurpassed in the UK, with a sizeable international reach and further growth potential.
- We inject transferable STEM skills and knowledge direct into the workplace for immediate employee and employer benefit, as students combine study while working.
• The employability value of our courses is underpinned by accreditation from leading STEM Professional Bodies and Learned Societies, as well as partnerships and sponsorship with leading employers.
• Our high quality, applied and academically relevant teaching and research addresses real-world issues, delivering impact for industry and society, including addressing pressing STEM skill-shortages across the UK.