

# PhD Studentship

## Design of VLSI Cellular Processor Arrays

*Microelectronics and Nanostructures Research Group  
School of Electrical Engineering and Electronics  
The University of Manchester*

This three-year PhD studentship is associated with an EPSRC-funded project on 'Fine-Grain Parallel Cellular Processor Arrays in 3D Silicon technologies'. The student will work with state-of-the-art VLSI design tools, researching the system architectures and circuit design of Cellular Processor Arrays – devices integrating thousands of processing “cores” in a massively parallel fine-grain array configuration on a single chip. In particular, design of ‘vision chips’, which integrate sensing and processing elements and provide a high-performance, low-power consumption alternative to conventional vision systems, with a range of applications from autonomous robots to retinal prostheses. The student will investigate the partitioning of processor architecture amongst multiple silicon layers and research circuit/layout design issues. A number of devices will be fabricated and tested during the project, implemented in emerging 3D fabrication technologies that allow stacking of multiple silicon layers in a single device. Sub 100nm bulk CMOS and Silicon on Insulator (SOI) technologies will be considered. The project involves international collaboration with partners in Finland and USA.

Candidates should have a degree in Electronics, Computer Engineering, or similar. First-class BEng graduates can apply, but relevant MEng or Masters degree is desirable. Background knowledge of digital and analogue circuits and interest in hardware design is essential. Some experience in VLSI design would be an advantage.

The project will be carried out in the Microelectronics Design Lab, School of Electrical and Electronics Engineering, The University of Manchester. The lab has recently moved to new accommodation, and is well equipped, with industry-standard EDA design tools and IC test equipment. The activities of the lab include adventurous research on novel computer architectures, cellular processor arrays, analogue and mixed-mode circuit design and brain-inspired VLSI systems. More information, including relevant publications, can be found on the lab research web page: <http://personalpages.manchester.ac.uk/staff/p.dudek/>

Enquiries should be directed to Dr. Piotr Dudek, School of EEE, [p.dudek@manchester.ac.uk](mailto:p.dudek@manchester.ac.uk)

Closing date for applications is 16 July 2010. The three year PhD project is available to start immediately.

**Funding:** Successful UK/EU applicants will receive full funding for tuition fees and a stipend of £13,290 per year, tax free. Non-UK/EU candidates will receive full funding for tuition fees, however, only a stipend of about £2,500 per year can be offered to such candidates. Please note that overseas students need to demonstrate maintenance funds in the region of £9,000 per year in order satisfy visa requirements, so they will need to obtain additional funding from other sources.

**Applications:** If you wish to apply please email a covering letter, full Curriculum Vitae and the names and contact details of at least two academic referees to Ms Marie B Davies [m.b.davies@manchester.ac.uk](mailto:m.b.davies@manchester.ac.uk)