Ref: E&PS-05887

# THE UNIVERSITY OF MANCHESTER

## PARTICULARS OF APPOINTMENT

## FACULTY OF ENGINEERING AND PHYSICAL SCIENCES
## SCHOOL OF COMPUTER SCIENCE

### Research Associate

1 The University invites applications for the above post which is tenable from 1/06/2015 to 31/05/2018 (for 3 years).

2 Salary will be £30,434 - £37,394 per annum (Grade 6) according to relevant experience.

3 Informal inquiries may be made to Dr. Vasilis Pavlidis and Dr. Milan Mihajlovic. Emails: pavlidis@cs.man.ac.uk, Milan.Mihajlovic@manchester.ac.uk.

4 Applications should be made on line. If you are unable to apply on line please request an application form by emailing hrrecruitment@manchester.ac.uk quoting the reference number or by calling 0161 306 4059.

5 The University of Manchester values a diverse workforce and welcomes applications from all sections of the community.

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| **Job title:** | Research Associate |
| **Salary:** | Grade 6 |
| **Start/duration:** | 1/06/2015 to 31/05/2018 |
| **Probation period:** | 9 months |
| **Based at:** | The University of Manchester |
| **Responsible to:** | Dr. Vasilis Pavlidis, Lecturer and Dr. Milan Mihajlovic, Lecturer |

## BACKGROUND

**The University of Manchester: Advanced Processor Technologies Group**

The University seeks to appoint a research associate in the School of Computer Science to work on an interdisciplinary project shared between the Advanced Processor Technologies (APT) and the Nano Engineering and Storage Technologies (NEST) groups. The candidate will conduct research related to the development and implementation of a simulation tool for the analysis and design of power distribution networks in emerging 3-D IC technologies taking into consideration thermal effects. The post will be hosted by the Advanced Processor Technologies (APT) group. The APT group is a vibrant community of interdisciplinary researchers working on a variety of topics including computer architecture, vertical integration, many-core architecture, and FPGAs, actively collaborating with industry partners. More information can be found at:

http://apt.cs.man.ac.uk
http://www.cs.man.ac.uk/~pavlidiv/index.html

## Overall Purpose of the Job

The principal aim of the project is to develop a novel simulation tool for the design and optimization of the power distribution networks for 3-D IC stacks including thermal effects. The specific tasks within the simulator design related to this post include the extraction of the thermal properties of a circuit and the development of novel cost functions and optimization techniques for the design of power distribution networks. The simulator will be based on monolithic coupling of the circuit equations with the temperature diffusion model of a substrate. Such approach should provide high accuracy, while being able to deal with large-scale industrial benchmarks.

You should have a PhD level qualification or experience in electrical and/or computer engineering or related discipline, ideally in the area of physical design automation. Expertise in design, analysis, and/or optimization of power distribution networks for integrated circuits and systems is highly desirable. Experience of optimisation techniques is also an important asset.

The successful candidate will be a part of a medium-sized research team and is expected to collaborate with a colleague PDRA and the two project supervisors on the design and implementation of the simulator. The candidate will be expected to communicate the results of the research to a wider academic and industrial community. The design process is highly creative and it is anticipated that the post holder will be able to develop and implement their own ideas.

## Key Responsibilities, Accountabilities or Duties

The range of duties will include:

- Conduct individual and collaborative research.
- Continually update knowledge and understanding in field or specialism.
- Translate knowledge of advances in the subject area into research activity.
- Use and develop new research techniques and methods.

- Use initiative and creativity to identify areas for research, develop new research methods and extend the research portfolio.
- Manage own research and administrative activities, with guidance if required.
- Write up research work for publication.
- Communicate complex information, orally, in writing and electronically.
- Communicate material of a specialist or highly technical nature.
- Attend and contribute to relevant meetings.

## PERSON SPECIFICATION

### Essential:

- Have, or be about to obtain, a relevant PhD in Electrical and/or Computer Engineering or related discipline.
- Evidence of journal publication record in the relevant field(s).
- Ability to work as a part of a medium-sized research team.
- Strong knowledge of VLSI design.
- C++/MPI and script programming skills.
- Specialist knowledge in the area of **physical design automation.**
- Experience in research methods and techniques to work on:
    - Power integrity analysis;
    - Design of power distribution networks;
    - Circuit modelling and simulation techniques.
- Evidence of work with optimization methods (exact and heuristical) for physical design of large-scale circuits.
- Excellent communication and interpersonal skills.
- Excellent time management and organisational skills.
- Ability to work independently and as part of a team.
- Flexible approach to dealing with research problems as they arise.
- Willingness to learn and develop.
- Ability to meet deadlines.

### Desirable:

- Evidence of experience on developing simulation frameworks.
- Knowledge of commercial physical design and sign-off tools (e.g., Cadence, Redhawk, Mentor graphics).
- Understanding of 3-D and 2.5-D integration technologies for circuits and systems.
- Experience with large scale software libraries.