

NOTES

- Forms must be downloaded from the UCT website: <http://www.uct.ac.za/depts/sapweb/forms/forms.htm>
- This form serves as a template for the writing of job descriptions.
- A copy of this form is kept by the line manager and the job holder.

POSITION DETAILS

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|--|---------------------------------------|
| Position title | Research Officer |
| Job title (HR Practitioner to provide) | |
| Job grade (if known) | 18 month contract |
| Academic faculty / PASS department | Engineering and the Built Environment |
| Academic department / PASS unit | Electrical Engineering |
| Division / section | |
| Date of compilation | 9 August 2017 |

ORGANOGRAM

(Adjust as necessary. Include line manager, line manager's manager, all subordinates and colleagues. Include job grades)



PURPOSE

The main purpose of this position is to contribute towards the research and development of advanced digital signal processing projects being carried out by the radar and remote sensing group (RRSG) and to assist in the guidance and supervision of research students and in co-authoring academic research papers.

The incumbent will be required to perform the following tasks in particular: Work in a team with other developers and researchers to develop components for digital signal processing (DSP) applications and prototyping, including contributions towards on-going research involving DSP development and specialized tools, related to application of radio astronomy, software defined radio and radar processing. The projects generally concern the development and optimization of DSP building blocks written in Verilog / VHDL / C / C++, which execute on hybrid computing platforms that constitute a combination of multi-core CPUs backend and FPGA front-end. Knowledge of radio theory and SDR processing is desired. The incumbent will take a senior role in a team, to advise on development and testing procedures and to contribute towards publication of research done by the group.

JOB CONTENT

| Key performance areas (4 – 6) (What) | | % of time spent | Activities / Objectives / Tasks (How) | Results / Outcomes (Why) |
|--|--|------------------------|--|--|
| 1 | Signal processing and FPGA-based development | 20 | Develop components of software defined radio applications for Astronomy | Guide and assist postgraduates in on-going research projects, assist for example in debugging or developing processing modules that can lead towards obtaining useful data and discoveries suited for publication. |
| 2 | Skills training and supervision of postgraduates | 20 | Candidate to gain deep understanding of relevant fields (particularly software defined radio backend processing, and elements of cognitive radio processing, and radio astronomy processing) in order to assist in student training and supervision, and to assist in skills training workshops / short specialist course. | Improving students' skills. Assist in making training workshop/specialist short course a reality. Improvement of the research group's graduation statistics. |
| 3 | Writing documentation (user manuals, datasheets) | 15 | The systems developed by the group require suitable technical documentation to ensure they are maintainable or can be integrated into future systems. | Product documentation / consolidation |
| 4 | Writing for publication | 30 | The research offer will be expected to contribute towards publication, both writing his/her own first-authored academic papers and collaborating as a co-author on other publications. Funding towards presenting at conferences will be available. | Publication of peer-reviewed journal and conference articles. |
| 5 | Budget management | 5 | The group has various sources of funding for which records of expenditure need to be kept and reports to be prepared. The candidate is expected to assist in particular with expenses reports. | Expenses record and completion of grant report to be submitted to funding agency |
| 6 | Code and data repository management | 10 | Certain products develop by the group need to have the available documentation consolidated and combined into a single easily accessible repository, which will facilitate reuse of these resources. Furthermore the group has terabytes of data, mainly recorded samples obtained for testing systems. These data files are valuable and important for research. The research offer needs to assist in consolidating this data and advising student where to get or save their data so that this data is well maintained and accessible. | Well-ordered code and data repository (if time permits presentation /training video to explain to group how to use the repository) |

MINIMUM REQUIREMENTS

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|-------------------------------------|---|
| Minimum qualifications | A PhD (or, substantial progress towards a PhD) degree in a relevant and related field (e.g. computer engineering, electronic engineering) with relevant practical experience. |
| Minimum experience (type and years) | Three years of design and development experience using C/C++ and experience programming FGPAs using a hardware description language (such as Verilog and/or VHDL). |

COMPETENCIES

| Competence | Level | Competence | Level |
|---|-------|-----------------------------------|-------|
| Analytical thinking / problem solving | 2 | Communications | 2 |
| Planning and organizing / work management | 2 | Teamwork / collaboration | 2 |
| Individual leadership | 2 | Coaching / developing others | 2 |
| Adaptability / flexibility | 2 | Conceptual thinking | 2 |
| Meeting facilitation | 2 | Professional knowledge and skills | 2 |
| Research support skills | 2 | Written communication | 2 |
| Creativity and innovation | 2 | Decision-making / judgement | 2 |
| Quality commitment / work standards | 2 | Results focus | 2 |

AGREED BY

| | PRINT NAME | SIGNATURE | CONTACT NO. | DATE |
|--------------|------------|-----------|-------------|------|
| Job Holder | | | | |
| Line Manager | | | | |
| HOD | | | | |