



POSITION DESCRIPTION

POSITION TITLE: Research Assistant

POSITION NUMBER:

DEPARTMENT/UNIT: Clayton School of Information Technology

FACULTY/DIVISION: Faculty of Information Technology

CLASSIFICATION: Level A

FRACTION: Full Time (1.0), Fixed-Term (1 year)

EFFECTIVE DATE: 5 January 2009

INCUMBENT: _____

SIGNATURE _____ **DATE** _____

APPROVED BY SUPERVISOR: Dr Jon McCormack

TITLE: _____

SIGNATURE _____ **DATE** _____

DEPARTMENT/UNIT HEAD: Professor Bala Srinivasan

TITLE: _____

SIGNATURE _____ **DATE** _____

DEAN/DIVISIONAL DIRECTOR: Professor Ron Weber

TITLE: _____

SIGNATURE _____ **DATE** _____

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ORGANISATIONAL CONTEXT

The Faculty of Information Technology comprises five onshore and two offshore schools and a number of research and project centres, and provides undergraduate and postgraduate degrees, conducts research and publishes academic material.

The Clayton School of Information Technology is one of five Victorian based schools of the Faculty which together deliver the Faculty's core teaching and research programs. The School has some 70 academic and research staff and some 1,000 enrolled equivalent full-time students in undergraduate, postgraduate and research degree.

The Head of School is accountable to the Dean for the academic leadership and management of the School including direction and management of its programs and academic and general staff, and deployment of its allocated infrastructure and facilities.

The postdoctoral research position is funded by an Australian Research Council Discovery project entitled "Design after Nature: Generative Models for Digital Media". This position is situated within the research Centre for Electronic Media Art (CEMA) comprised of investigators from the Faculties of Information Technology, Art & Design and Arts (Music). CEMA is an inter-disciplinary research group, established to explore the creative possibilities of computer science in the visual and sound arts.

KEY RESULTS AREAS AND RESPONSIBILITIES

The Research Assistant will be expected to participate in all aspects of the research team's activities, including: discussions with project investigators and postgraduate students; the acquisition and processing of data; primary research from biological and computer science literature; design, implementation and testing of software; the analysis and reporting of research results.

Working under the direction of his/her supervisor within the research team, the Research Assistant's duties will be focussed on developmental modelling, ecosystem modelling, and on new algorithm development, implementation and testing. The Research Assistant will work cooperatively within the research team on all aspects of the research, but will take particular responsibility for the development of extensions to existing research in developmental modelling and the adaptation of ecosystem models from biology to applications of creative design.

In collaboration with the research team, it is expected that the Research Assistant will annually submit their research results in papers to international conferences and journals over the course of the project. The Research Assistant will also work in close collaboration with two PhD students who will be involved in researching complementary aspects of the project.

KEY SELECTION CRITERIA:

Essential

- A Bachelor's degree with Honours or equivalent qualification in Computer Science, Mathematics, Complex Systems, Biology or a related discipline.
- The applicant must hold or have submitted a PhD in any relevant area of Artificial Life, Adaptive Systems, Evolutionary Computing, Biological Modelling and Simulation, Computer Graphics or similar discipline by the date of appointment.
- Demonstrated the ability to carry out high quality applied research.
- An understanding of Artificial Life and Evolutionary Systems methods, and how they may be successfully applied to problems in creative design.
- The ability to work as part of a research team and interact with research members across the disciplines of computer science, visual art and design.

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- Strong spoken English communication skills and good written English skills.

Desirable

- A PhD that combines sound technical research in the relevant areas (listed above) and applies it to the successful solution of problems in creative design.
- Experience with developmental models, such as L-systems, ecosystem models, homeostatic models, evolutionary computing methods such as genetic algorithms and genetic programming.
- Programming experience with Java or C++ and OpenGL under Unix and Mac OS X operating systems.
- Understanding of aesthetic issues and design applications of technology.
- The ability to undertake independent research and to initiate new research ideas.
- The desire to solve practical problems arising in creative design.

OTHER JOB RELATED INFORMATION:

- The successful applicant will undertake research in generative systems design as part of this collaborative research team. The project involves investigation into the application of Artificial Life methods for creative design. Specifically, this will involve research into developmental models suited to the automated construction of three-dimensional form. Populations of entities based on these models will then be subject to evolution and adaptation using algorithms inspired by ecosystem models. The goal of the research is to devise new methodologies for creative design and to develop a stronger theoretical understanding of ALife systems for generative design and creativity.

The aims of the research are to:

- Develop new methods of generative design, inspired by biological phenomena, and can be used to produce rich and complex three-dimensional graphical environments;
- Develop new methods of interaction with biological models that allow efficient and rapid exploration of complex design spaces; and
- Develop a scientific basis for deriving and assessing such features.

It is expected that this work will build on existing models developed by the investigators; software developed by the Artificial Life and Evolutionary Computing research communities; and algorithms developed from scratch within the project. The research may also involve some analysis of data, the design of numerical experiments, the numerical evaluation of new algorithms, and the analysis of algorithm performance. The successful applicant will participate in presentation of the research results at seminars and conferences, and will, as part of the research team, write scholarly papers for publication in academic journals.

Candidates must have experience of Artificial Life simulation programming and the application of biologically inspired methodologies to creative domains. Preferably you will have some familiarity with graphics programming APIs such as OpenGL or Open Scene Graph. The desire to solve practical design problems of the kind arising in art & design applications is an important motivation for this research.

The positions will be funded at Research Assistant Level A, under the Australian academic salary scales, for one year fixed term. No funding is available to support relocation. Because the team has been consistently successful in attracting new funding, it is envisaged that further research opportunities within the group may become available on successful completion of this initial contract.

The position will be located at Monash University Clayton Campus.