Summary of Discovery Projects Proposals for Funding to Commence in 2010

DP1093170  Prof MJ Jacobson; Dr C Hu; A/Prof DC Richards; Dr M Kapur; Dr CE Taylor
Approved  Multi-user virtual environments and research into the learning and transfer of scientific knowledge and inquiry skills
Project Title
2010 : $ 150,000
2011 : $ 100,000
2012 : $ 100,000
Primary RFCD 3301 EDUCATION STUDIES
Administering Organisation  The University of Sydney

Project Summary
The aim of this project is to understand how innovative multi-user virtual environments (MUVEs) can be designed and used in Australian schools to enhance the learning of important scientific knowledge and inquiry skills. Working closely with teachers in secondary science classes, researchers will investigate ways in which the features of intelligent agents in educational MUVEs enable innovative pedagogical approaches that have the potential to enhance learning in secondary science classes. In addition, this project will develop science inquiry-based curriculum modules employing MUVEs that run on computers being distributed as part of the national Digital Education Revolution initiative.

DP1096276  Prof A Jamalipour; Mr KS Munasinghe
Project Title
2010 : $  90,000
2011 : $  65,000
2012 : $  65,000
2013 : $  65,000
Primary RFCD 2917 COMMUNICATIONS TECHNOLOGIES
APD  Mr KS Munasinghe
Administering Organisation  The University of Sydney

Project Summary
Ubiquitous communications service is the most important element of today's societies. In urban and rural areas of the country as well as at the time of natural disasters such as bushfires, floods, cyclones, it is vital to devise alternative schemes to create and sustain on-demand telecommunications services. In most cases it is not the lack of technology that hinders the implementation of a reliable communications service, but it is the resource allocation. In this project we propose a novel sustainable resource management framework inspired by natural ecological systems to solve the above problem. Upon completion, Australia will be in forefront of technologies related to the management of complex networks.

DP1095320  Dr V Jayaswal
Approved  Statistical methods for analysing multi-source microarray data and building gene regulatory networks
Project Title
2010 : $  85,000
2011 : $  83,000
2012 : $  83,000
Primary RFCD 2302 STATISTICS
APD  Dr V Jayaswal
Administering Organisation  The University of Sydney

Project Summary
I will devise a statistical learning technique that does not force a gene to be assigned to exactly one category. This technique reflects the biological reality that a gene can belong to two or more functional categories. Therefore, the new technique will improve a model's ability to identify regulatory genes in different types of cancer; these regulatory genes can be targeted by new anti-cancer drugs resulting in a more effective treatment. I will model gene regulatory networks using microarray data from multiple sources. These networks will be used to identify regulatory cliques - a group of genes that are vital for a cellular function. This will improve our understanding of debilitating conditions such as asthma.