



SCHOOL OF ELECTRICAL, COMPUTER AND TELECOMMUNICATIONS ENGINEERING

ECTE457 Thesis – Projects 2008

Rev3

A.1 Power Quality and Reliability, e.g., equipment behaviour, modelling techniques, monitoring and data analysis, power conditioning, power system disturbances, standards and management.

Name	Topic	Description (25-30 words only)
S.Perera/Danny Sutanto	Impact of Unbalance on Power system operation	To investigate the effect of voltage unbalance in a three phase system on the power system operation, particularly on network losses
Sarath Perera	Flicker indices Pst and Plt calculation	To calculate flicker indices Pst and Plt calculation using half cycle rms voltages
Sarath Perera	Flicker due to multiple motor starts	Investigation into flicker from multiple motor starts
S.Perera/Danny Sutanto	Harmonic loss and cost estimation	Investigation into Harmonic loss and cost estimation over large power systems
S.Perera/Danny Sutanto	Modelling of air conditioner terminal behaviour	Testing and PSCAD/EMTDC modelling of air conditioner terminal behaviour – investigation into the sub harmonic/interharmonic current emission
Sarath Perera	Overvoltage protection using surge arresters	Risk based life cycle management of overvoltage protection (surge arresters)
Sarath Perera	Voltage Sags Estimation Fault location in distribution system	Estimation of voltage sags in power system Develop Fault location algorithms for distribution systems
Sarath Perera	Modelling of relay contactors for voltage sags	Investigate the behaviour of protective relay contactors during voltage sags
Sarath Perera	Impact of voltage sags on induction motors	Investigate the impact of induction motor starting (primarily single phase air conditioners)
Sarath Perera/Danny Sutanto	Voltage Drop Calculations	Validation of factors in voltage drop calculation for distribution system
Sarath Perera	Susceptibility to voltage sags	Equipment susceptibility for voltage sags in a auto recloser environment
Sarath Perera	Single phase induction motor modelling	PSCAD/EMTDC single phase induction motor models modelling of saturation and parameter estimation by experiment
Sarath Perera	PQ Standards	PQ standards for distributed generation in distribution system
Sarath Perera	Modeling of doubly fed induction generator	Doubly fed induction generator modelling for wind farms
Sarath Perera	Doubly-fed induction generators for wind power	Investigate the contribution of wind generation doubly-fed induction generators contribution to network faults
Sarath Perera	Modeling of Wind Generator	PSCAD/EMTDC single phase induction motor models modelling of saturation and parameter estimation by experiment
Danny Sutanto	Peer Response System	Development of a Peer Response System (PRS) to improve learning
Danny Sutanto	Compensation of Non-Active current	To design and implement a compensation system against non-active currents
Danny Sutanto	Active, reactive and apparent power in a non-sinusoidal system	Investigate the use of instantaneous power calculation to evaluate active, reactive and apparent power in a non-sinusoidal system
Danny Sutanto	Classification of Power Quality Event	To classify different power quality waveforms using Time Frequency Representation
Danny Sutanto	Clustering Power Quality Event	To investigate the use of data mining clustering technique to classify power quality events

A.2 Power Electronics, e.g., converters, renewable energy sources, simulation techniques, variable speed drives.

Name	Topic	Description (25-30 words only)
Danny Sutanto	Investigation of reactive power and power factor in a dc-dc converter	Instantaneous power calculation of reactive power and power factor in a dc-dc converter for design purposes
Danny Sutanto	Design of a buck boost converter for a fuel cell system	To design and implement a new buck boost converter for a fuel cell system
Danny Sutanto	Battery Energy Storage System	To design and implement a battery energy storage system to improve power quality and provide power factor correction
Danny Sutanto	A smart home system	To design and implement a smart home system that can control the electric circuit in a home using the internet.

B.1 Biomedical Engineering, e.g., computer vision, image processing.

Name	Topic	Description (25-30 words only)
Lam Phung	Tracking moving objects with a PTZ camera	This project aims to develop a system for tracking a moving object using a pan-tilt-zoom controllable camera. This project will require knowledge of MATLAB and C++.
Lam Phung	Detection of Visual Objects for Video Analysis	This project will study machine learning techniques for detecting important visual objects such as people, car and faces in video. This project will require knowledge of MATLAB.
Prashan Premaratne	Stereoscopic Vision for Robotic Vehicle	A 3 camera-based stereoscopic vision system to drive an autonomous robotic vehicle using Matlab.
Salim Bouzerdoum	Nonlinear feature extraction for Illumination Invariant Biometric Identification	The objective of this project is to develop an advanced automatic vision system for detecting, locating and recognising objects and humans in highly complex and dynamic environments. Automatic techniques for detecting, identifying and tracking objects in real-time are in huge demand due to their potential use in a wide variety of real-world applications, such as surveillance, traffic monitoring, war intelligence collection, and fighting terrorism and crime. Examples of biometrics include fingerprints, face recognition, voice recognition, hand geometry, signature recognition, iris recognition, DNA, etc. However, the performance of existing biometric identification systems is heavily affected by intrinsic and extrinsic image distortions. This project aims to investigate nonlinear feature extraction and classification techniques for improved biometric identification.

B.2 Computer Systems, e.g., computer networks, computer-assisted instructional systems, embedded systems, Web-based systems.

Name	Topic	Description (25-30 words only)
Fazel Naghdy	New Architecture of wireless ad-hoc control networks nodes	Wireless ad-hoc control networks are highly distributed systems for control and monitoring of the real time system. In this project, the third generation of the nodes will be developed based on Zig-Bee.
Golshah Naghdy	Active Surveillance Vision	This project is mainly concern with designing an active surveillance camera with the tilt and pan platform, which could be controlled by computer to drive the camera according to any trajectory generated by tracking program.
Golshah Naghdy	Visual Tracking of Moving Objects	In many computer vision applications, particularly in surveillance cameras it is important to be able to track a target or intruder. This task is divided into two parts: The tracking hardware and the vision based tracking software. This project is about the tracking and trajectory generating software.
Golshah Naghdy	Wavelet Neurones and Artificial Retina	This project will concentrate on designing and simulating an artificial retina which uses Gabor wavelet filters tuned to various frequency and orientation as feature detectors. Each filter simulates the receptive field profile of a pair of simple cells. Various experiments will be performed using different feature vector sizes.
Golshah Naghdy	Computer Visual Face Recognition for Security Purposes.	One of the most challenging computer vision tasks is human face recognition. Each face as seen by a camera attached to a computer possesses unique features that need to be detected and stored for future classification. This project will concentrate on visual face recognition for security purposes.
Golshah Naghdy	Content-Based Image Retrieval and annotation	Content-based image retrieval (CBIR) is an attractive alternative to the conventional keyword based techniques in that it allows for the search to expand beyond some preset criteria. This project will look at automatic image annotation for semantic CBIR.
Golshah Naghdy	Smart Health Monitoring System for Home Health Care and Telemedicine	The aim of this project is to design and implement an intelligent and non-invasive home based health monitoring system for preventive and ongoing health care. The system uses wearable health monitoring equipments as well as surveillance cameras.
Lam Phung	Developing a system of networked cameras	This project aims to develop a system of networked cameras for use in video surveillance research. This project will require Internet and video programming using the Visual Studio .NET tools.
Lam Phung	Real-time video processing using FPGA	This project aims to develop a real-time video processing system that is based on an FPGA platform. Example processing tasks include colour filtering and object tracking. This project will require low-level programming.
Raad Raad	A new low power medium access protocol for sensor networks	The project requires the implementation of a new wireless low power medium access control protocol. The project provides experience in real time operating systems, protocol design and sensor networks.
Christian Ritz	Authoring tools and protocols for communicating learning designs in a standards-compliant format	This project, in collaboration for staff from the Faculty of Education, will build upon and extend the previously developed software tool WILDE (Wollongong Integrated Learning Design Editor), which is an intelligent authoring tool for learning designs. This project is part of a much larger industry funded project.
K-W Chin	Internet Topology Modelling.	The project will answer the following questions. What does the Internet look like? How do we create a model of the Internet for simulation purposes?
K-W Chin	Longitudinal study of multiple origin autonomous systems (ASs) conflicts.	In theory, autonomous systems (ASes), such as ISPs, should only advertise their allocated IP addresses. However, we are beginning to see multiple ASes advertising the same IP addresses. What are the reasons for this? Are these ASes trying to hijack traffic, or is it simply mis-configurations?

K-W Chin	IP Lookup Algorithms	Core routers on the Internet forward packets at Gb/s. A key bottleneck in the forwarding process is the time taken to look up the out-going port and next-hop address. This project will first investigate the routing table of core routers, and then devise a Gb/s capable IP lookup algorithm.
Montse Ros	Pen drawing recognition using an inertial measurement unit (IMU)	Write software to capture and interpret gyroscopic and acceleration information from an IMU (connected through a PC's serial or USB port). The IMU will be attached to a pen and the software should display the pen tip's movements on the PC screen (on a 2D canvas) as an alternate method of drawing input for the PC.
Montse Ros	Localised indoor visual asset tracking using GPS.	Design and construct a low-cost, low-power microcontroller platform for use indoors. The platform should be able to obtain its GPS position by using a known position from a nearby device, with GPS satellite visibility, and distance measurements. The platform will require some form of wireless communications as well as a localisation algorithm to determine its position. At least two such platforms should be created and tested.
Montse Ros	Efficient TINI/AX-12 Communications Controller and Java API	Design and construct a microcontroller-based communications controller between the TINI Tutor Board (RS232 interface) and the AX-12 Dynamixel series robot motor. The motor interface is a 3 wire multi-dropped serial network using half-duplex asynchronous communications. To demonstrate swift, efficient communication between the TINI Tutor Board and motor, the student will produce a Java API that will provide control over basic functionality of the motor through a 'MotorManip' class, or similar.
Montse Ros	Patient Administration System for PDA access using a Bluetooth webserver.	Implement a linux webserver with blueZ stack hosting a website with forms and backend database storing patient data. The webserver should respond to requests from PDAs for downloading/viewing webpages over Bluetooth. Multiple users must access the same Bluetooth webserver. The user will enter information into the PDA and submit the forms for updating the database. Password authentication and secure data transmission are required.
Montse Ros	Using an inertial measurement unit (IMU) to capture pen gestures	Design and construct a device that captures gyroscopic and acceleration information from a pen and transmits it wirelessly to a PC. The device should be lightweight and easily attached to any pen. The device will consist of an IMU, microcontroller and Bluetooth radio for data transmission.

B.3 Mechatronics, e.g., control systems, microcontrollers, real-time control, robotics, servo mechanisms.

Name	Topic	Description (25-30 words only)
Fazel Naghdy	Telepresence	The project will develop a system for remote control of a robotic manipulator using haptic rendered virtual model of the robot. The robot is equipped with force sensors.
Montse Ros	Localised indoor visual asset tracking using GPS.	Design and construct a low-cost, low-power microcontroller platform for use indoors. The platform should be able to obtain its GPS position by using a known position from a nearby device, with GPS satellite visibility, and distance measurements. The platform will require some form of wireless communications as well as a localisation algorithm to determine its position. At least two such platforms should be created and tested.
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		TINITutor Board and motor, the student will produce a Java API that will provide control over basic functionality of the motor through a 'MotorManip' class, or similar.
Montse Ros	Using an inertial measurement unit (IMU) to capture pen gestures	Design and construct a device than captures gyroscopic and acceleration information from a pen and transmits it wirelessly to a PC. The device should be lightweight and easily attached to any pen. The device will consist of an IMU, microcontroller and Bluetooth radio for data transmission.
Stephen Pan	Easy programming for Humaniod robot	The aim of this project is to develop a software interface which can easily convert walking pattern acquired from human being to a Humanoid robot program. The programming skills and computer interface knowledge are required.
Stephen Pan	Advanced walking pattern design of Humaniod robot	A Humanoid can stand up and balance itself! The next step is to walk forward. Designing walking patterns, or gaits, involves various intelligent control strategies and learning methods. The project will involve microcomputer and control theory.
Stephen Pan	Intelligent control of autonomous blimp	This project will develop an autonomous controlled blimp system which can navigate to desired target without any human interference. The student will focus on hardware design, Microcontroller design and programming.
Jiangtao Xi	Self-mixing interferometry sensing	The project aims to study the self-mixing interferometry and its applications to displacement and vibration measurement
Jiangtao Xi	Blind separation of audio/speech signals	The project aims to separate audio/speech signals that are mixed in convolutive environment without having any knowledge about the signals and the mixing.
Jiangtao Xi	3D human face acquisition based on structured light projection (SLP)	The project aims to acquire 3D information of human faces using SLP technology and display the information on computer screens.
Prashan Premaratne	Twin Ducted-Rotor VTOL UAV using computer vision for navigation	Design and development of a twin ducted-rotor vertical take-off and landing air vehicle with computer vision for navigation is the ultimate challenge in design of a UAV.
Prashan Premaratne	SLAM for AutoRoVe II	Simultaneous Location and Mapping for autonomous robotic vehicles is a fascinating approach to realize intelligence in vehicles.
Daniel Franklin	3D ultrasonic beamforming array	Using a two-dimensional transducer array, you will build an ultrasonic beam scanner capable of imaging a surface without the need for moving parts. This project will involve analog and digital electronics, signal processing and software development on a variety of platforms.

C.1 Digital Signal Processing, e.g., audio scene processing and segmentation, image processing, intelligent information processing, speech processing, speech and audio compression, video processing.

Name	Topic	Description (25-30 words only)
Prashan Premaratne	Automatic volume controller for Televisions	When advertisements are displayed on television, the volume level is significantly higher than when telecasting normal programs. This can be tackled by a microcontroller-based sound-level meter and a universal remote controller.
Prashan Premaratne	Microcontroller based low cost PC USB Oscilloscope	Design and development of a PC USB oscilloscope will pave way for inexpensive oscilloscopes for all the electronics enthusiasts.
Prashan Premaratne	Can the ECG signals gathered from simple headband type gear control consumer electronics?	Completely paralysed people can have some hope of communication if their thoughts can be captured using a simple device.
Salim Bouzerdoum	Signal Processing for Through-the-wall radar imaging	Although the human eye cannot see behind the walls and through opaque surfaces, most walls are transparent to electromagnetic (EM) waves, especially in the range 250MHz to 3GHz. Microwave radar can sense the breathing of person and detect their movement behind walls. TWR imaging has been sought out in rescue missions, behind-the-wall target

		detection, surveillance and reconnaissance. While there are reported successes in through-the-wall sensing, numerous improvements can be envisioned for future systems. The aim of this project is to develop advanced signal processing algorithms to detect targets and the presence of persons behind walls and track their movements.
Salim Bouzerdoum	Machine Learning using Recurrent Neural Networks and Evolutionary Computation	Techniques such as neural networks, Bayesian networks, genetic algorithms (GA's) and support vector machines (SVMs), collectively known as learning machines, have become the preferred methods for intelligent information processing in many applications in which data relationships, decision processes and predictions have to be learned or modelled from examples. Over the past two decades they have emerged as effective information processing techniques and powerful computational tools that play an important role in adaptive pattern recognition, with extensive industrial applications. The aim of this project is to develop machine learning techniques using recurrent neural networks and evolutionary optimisation algorithms such as Genetic Algorithms (GA's) and Particle Swarm optimisation (PSO). The developed algorithms will be applied to solve some practical pattern recognition problems.
Ian Burnett	MPEG-21 in 3D Virtual Worlds	Adapting MPEG and MPEG-21 to virtual worlds. Using the Virtual world to shift 2D document standards to 3D worlds. A suitable example is Second Life but this requires the project student to have ADSL access outside UoW
Ian Burnett	Recording Spatial Audio Objects	Recording spatial audio objects requires new microphone technologies. In particular, cylindrical and spherical microphones are being investigated. This project will build and test these new microphone technologies.
Xiaojing Huang	Sample rate conversion for multiband software defined radio	Sample rate conversion is a fundamental building block for software defined radio. This project aims at implementing an arbitrary ratio SRC using B-spline interpolation.
Christian Ritz	A psychoacoustic analysis tool for music	This project, in collaboration with the Faculty of Creative Arts, will develop a software toolbox that provides real time analysis of Psychoacoustic properties (e.g., tonalness, roughness) for use in composing new forms of music.
Christian Ritz	Distributed audio compression	This project will investigate the compression of audio captured from a distributed network of microphones, for applications in teleconferencing and audio surveillance.
Christian Ritz	Spatial Audio Coding	This project will develop new algorithms and perform novel research into the compression of multi-channel audio.
Christian Ritz	Multichannel Audio Delivery using Thin Film Speakers	This project will investigate, analyse and develop appropriate hardware and/or software for the delivery of multichannel (e.g. surround sound) audio using thin film speakers.
Jiangtao Xi	Pre-processing of signals from Optical feedback self-mixing interferometry (OFSMI)	This project will develop new algorithms for processing the signals from OFSMI systems, including the mathematical model studies, noise and interference removal, signal level normalization etc
Daniel Franklin	USRP high-speed spectrum analyser	Modify the FPGA firmware on the Universal Software Radio Peripheral so that it can be used to downconvert and digitise the output of a communications receiver so that we can perform spectral analysis in software on the host PC. Ultimately it should be possible to dump a full spectrum from DC to 2.6 Ghz with arbitrarily high frequency resolution.
Daniel Franklin	Automatic Music Transcription	Further development of software to try to automatically reconstruct a musical score from a recorded piece of music
Daniel Franklin	3D ultrasonic beamforming array	Using a two-dimensional transducer array, you will build an ultrasonic beam scanner capable of imaging a surface without the need for moving parts. This project will involve analog and digital electronics, signal processing and software development on a variety of platforms.

C.2 Multimedia and the Internet, e.g., content hosting and delivery, embedded internet systems.

Name	Topic	Description (25-30 words only)
Kwan-Wu Chin	Building a RFID-Enhanced Sensor Network	This project will develop a driver for the SkyTek M1 RFID reader on the TinyOS sensor platform. The driver will be used in wireless sensor networks capable of tracking RFID tagged objects.
Christian Ritz	Authoring tools and protocols for communicating learning designs in a standards-compliant format	This project, in collaboration for staff from the Faculty of Education, will build upon and extend the previously developed software tool WILDE (Wollongong Integrated Learning Design Editor), which is an intelligent authoring tool for learning designs. This project is part of a much larger industry funded project.
Montse Ros	Patient Administration System for PDA access using a Bluetooth webserver.	Implement a linux webserver with blueZ stack hosting a website with forms and backend database storing patient data. The webserver should respond to requests from PDAs for downloading/viewing webpages over Bluetooth. Multiple users must access the same Bluetooth webserver. The user will enter information into the PDA and submit the forms for updating the database. Password authentication and secure data transmission are required.
Farzad Safaei	Immersive video delivery	This project aims at evaluating and enhancing the immersive video conferencing service developed by our research team and integrates this capability with the multiplayer game platform.
Daniel Franklin	Wifi Clock Radio	Design and build a clock radio which can stream content from the Internet or from a local media server over a wireless interface. You will interface an mp3-player IC with an audio amplifier, a microcontroller and a wireless network interface, and add a simple LCD and push-button user interface.

C.3 Telecommunication Networks, e.g., access technologies, e.g., modem and ADSL, mobile computing, wireless communications.

Name	Topic	Description (25-30 words only)
K-W Chin	Conserving Energy in Wireless Sensor Network Using Opportunistic Transmissions and Node Density.	Energy conservation is a critical issue in wireless sensor network. This project will investigate whether opportunistic transmissions and node density help reduce power consumption. The student will carry out his/her investigation using simulation.
K-W Chin	Fast Collision Resolution Algorithms for Wireless Ad-Hoc Networks.	Collision is a key problem in wireless systems. The project will investigate various backoff algorithms in wireless networks with varying node density and traffic conditions.
K-W Chin	New Backoff Algorithms for Wireless Mesh Networks with Directional Antennas.	Backoff algorithms play an important role in ensuring high network capacity. This project will develop new backoff algorithms that are suitable for wireless mesh networks that use directional antennas.
K-W Chin	Energy Efficiency of RFID Tag Reading Protocols.	The project will implement and simulate RFID tag reading protocols and quantify their energy expenditure.
K-W Chin	Energy Efficiency of Multi-Readers RFID Systems.	The project will determine whether having more than one RFID readers help prolong the lifetime of a RFID-Enhanced Wireless Sensor Network.
Kwan-Wu Chin	Channel Scheduling Algorithms for Concurrent Transmit/Receive Wireless Ad-Hoc Networks	This project aims to design and simulate link scheduling algorithms that maximize the capacity of a directional antennas equipped wireless ad-hoc network. Such algorithms will enable future wireless "hot-spots" to carry real-time traffic such as video.
Kwan-Wu Chin	Routing Policies and BGP Convergence Time	The border gateway protocol (BGP) can be considered as the "heart" of the Internet. However, little is known about its convergence properties, especially when the routing policies used by ISPs are confidential. This project therefore aims to investigate the impact different policies have on BGP's convergence time.

Kwan-Wu Chin	Conserving Energy in Wireless Sensor Network Using Opportunistic Transmissions and Node Density	Power consumption is a critical issue in wireless sensor network. This project will investigate whether opportunistic transmissions and node density help reduce power consumption. The student will carry out his/her investigation using simulation and the Berkeley Motes sensor platform.
Daniel Franklin	Flexible wireless sensor network platform	Continue a project from last year which developed a basic Atmel-based sensor node with ZigBee wireless communications stack. We need to add an ad-hoc routing protocol, and a range of sensor and controller boards to interface with the device.
Eryk. Dutkiewicz	Design and Optimization of Large-Scale ZigBee Sensor Networks for Industrial Monitoring	This project will involve design, optimisation and performance evaluation of ZigBee wireless sensor networks for large-scale industrial monitoring using Freescale's ZigBee Development Kits.
Eryk. Dutkiewicz	Design of Wireless Body Area Network for Environmental Monitoring	This project will investigate dynamic environmental monitoring where environmental monitoring officers will be equipped with various sensors to gather environmental and biometric information. The methods for reliable and power efficient gathering and exchanging of sensor data will be implemented and demonstrated in a prototype based on the Crossbow wireless sensor network platform.
Eryk. Dutkiewicz	Design of Wireless Sensor Network for Monitoring of Power Transmission Lines	This project will involve the design of a wireless sensor network to obtain real-time data from power lines to aid in fault detection and emergency responses. The design will be prototyped using the Crossbow wireless sensor network platform.
Montse Ros	DAB radio using a USRP	The student will simulate and implement (using a Universal Software Radio Peripheral) a software radio for the purpose of receiving Digital Audio Broadcast (DAB) radio. This thesis is mostly software based (matlab/simulink simulations) though the final solution will be implemented on the USRP hardware.
Montse Ros	GPS location device using a USRP	The student will simulate and implement (using a Universal Software Radio Peripheral) a software radio for the purpose of receiving and using GPS information to triangulate location. This thesis is mostly software based (matlab/simulink simulations) though the final solution will be implemented on the USRP hardware.
Xiaojing Huang	Digital IQ imbalance compensation for OFDM receiver	IQ imbalance is a practical impairment which affects OFDM system performance. This project develops efficient digital technique for IQ imbalance compensation for OFDM receiver.
Don Platt	Automated design of large scale networks	When the network size reaches 50 nodes and above, the number of possible designs becomes too large to compute. This project will develop sub-optimal methods to compute the design of a network.
Don Platt	All-Optical buffer for packet switches	An optical bitstream cannot be stored (buffered) like an electronic one. This project will build an optical buffer which is suitable for an all-optical packet switch.
Don Platt	Protection in an all-optical, timetabled network	When it is running on a fixed timetable, how will the network realize there has been a link failure, and how should it respond? We will answer this in simulation.
Don Platt	Neural networks for design of WAN	The neural network is a general computing system. This project will investigate its applicability to some network computations, eg network design and resource allocation.
Prashan Premaratne	Patch Antenna Array	Designing an impedance matched 8 element patch antenna array 2.4GHz
Raad Raad	A Multi-radio sensor network platform	The project requires the design and implementation of a new sensor board that will support multiple radio chip sets. The board will be built around an ATML microcontroller. The project provides experience in microcontroller board design for sensor network applications.

Raad Raad	A new low power medium access protocol for sensor networks	The project requires the implementation of a new wireless low power medium access control protocol. The project provides experience in real time operating systems, protocol design and sensor networks.
Raad Raad	Routing protocols in a wireless cooperative network	The project requires the implementation of a number of routing protocols for sensor networks in the Opnet Modeler Network simulator. The project provides experience in wireless network routing protocols and their applications.
Raad Raad	Directional antenna for a sensor network platform	The project requires the design and building of a directional antenna array for use with a sensor network platform. The project provides experience in directional antenna design and implementation.
Raad Raad	Design of a new RFID sensor network platform	The project requires the design and integration of Radio Frequency Tag with the Mica-2 sensor network platform. This involves interfacing the two modules. The project provides experience in hardware design.
Peter Vial	Software Defined Radio	The school has purchased some modules that will allow the development of Wireless radios with dual antenna Space Time Systems. We will develop, design and install the software required to implement such systems.
Tad Wysocki	Polarization Diversity	The project will involve research into application of the polarization diversity technique to improve performance of digital wireless transmission considering two possible approaches, i.e. receive and transmit diversities.
Tad Wysocki	Multi-node Diversity	The project will investigate possible performance gains that can be achieved through the use of multiple retransmission nodes in ad-hoc networks, i.e. minimize the energy used while maximizing the throughput.
Tad Wysocki	Characterization of cross-polar indoor scatter	The project will involve a series of measurements of cross-polar scatter coefficients performed in different indoor scenarios with the results processed in order to find their statistics.
Ian Burnett	AJAX Collaborative Citizen Journalism Tools	YouTube video uploads are big news. AJAX is the latest web technology. Build an AJAX based multimedia collaboration tool which can be used from a standard browser. The tool should allow users to upload their special event videos and create a collaborative 'citizen journalism' site.