PROJECT TOPICS; 2004-8

ACADEMIC STAFF PROJECTS

Dr A.Abu Saida
Application of static phase shifter units in HVDC systems
Effect of sulphur on transformer solid insulation simulated under accelerated aging conditions
Electrical distribution network design for a shopping complex in Kuala Lumpur
Enhancing power transfer capability using adaptive on line transformer tap changer settings.
Impact of a load model on power transfer capability of an OLTC

Dr K-S Chan
A new addressing scheme for mobile ad hoc networks
Enhancing reliability in unicast mobile and ad-hoc networks.
MAC for a mobile ad-hoc network
Multi-hop ad-hoc network
Performance enhancement of wireless TCP
Providing improved packet transmission through a power line communication medium
QoS guarantee in wireless LAN
QoS routing in a mobile ad-hoc network ( MANET )
TCP performance enhancement over MANET
Wireless ad hoc sensor network prototype

Prof. K.Chung
An FPGA implementation of a frequency offset estimation scheme for a DVB-T receiver.
Development of wireless telemetry system for the Curtin Motorsport team
Development of a panoramic image processing technique from multiple images.
Embedded PC implementation of the multi-warp routing protocol
Error control in wireless transmission of compressed video
Error resilient transmission of Huffman compressed images
FPGA implementation of a channel equalisation scheme using an FPGA
Implementation and comparison of wavelet image compression algorithms
Implementation of a multi-warp Routing protocol
Implementation of Reed-Solomon EEC for compressed images.
Influence of imperfection of I-Q modulator on the generation of an ODFM signal
IQ compensation in dual branch receivers
IQ impairment compensation in a DVB-T receiver
Micro-controller controlled data line
Mining entity position sensing
Modelling of wavelet compressed images
Multirate data transmission using direct sequence spread spectrum
Panoramic image capture system.
Remote surveillance camera with motion detection
Routing protocol for a fixed ad-hoc network
Synchronisation of two independently received digital TV signals over the Internet.
Throughput evaluation of a PLC modem
Wireless alarm
Wireless distance detector
Wireless modem

M.Darby
3D modelling and specification for prototyping aircraft and integration within FDM
Adaptive learning
An architecture for a collaborative learning environment prototype
Communications interface between intelligent agents in a high-level architecture system
Design of a collaborative learning environment through simulation using high level architecture and run-time infrastructure.
Expert system for determining a student curriculum
Intelligent sensors
Interface development and integration of open source flight dynamic simulation model to the HLA standard
Prototype of a collaborative learning environment by implementing an artificial intelligence mentor
The knowledge map

Dr H.Eren
Development of peer to peer communication for an instrumentation system
Electronic Portable Instruments
Error control in wireless transmission of compressed video
Home power monitoring
Implementation of an intelligent mentoring system
Investigation of an active RFFD
Investigation of the operation of a passive RFFD
Peer to peer wireless communication of PLCs
Remote tracking algorithm using low-cost satellite GPS
Security system
Vibration measurement in electrical machines.
Wireless electric motor condition monitoring
Wireless human condition monitoring using wi-fi or Zigbee
Wireless network for a PLC
Wireless PLC machine monitoring
Wireless Radio Frequency communication in home automation
Wireless sensor networks
Wireless web sensors
Zigbee based wireless instrument network

Dr R.Howard
Low-noise balanced microphone pre-amplifier

Prof. S.Islam
A protection system for an industrial plant.
Active power correction of induction type wind turbines
Analysis of harmonic effects in the operation of differential relays.
Analysis, modelling and simulation of the Kalgoolie nickel smelter power systems
Artificial Neuron Network load flow analysis
Continuity of generation of a distributed generation islanded power system following an emergency
Demand side management of non-essential loads
Design of a sub-station grounding system
Determination of various commercially available APC unit's compatibility in distribution system flickers.
Determining the protection adequacy of an islanded distributed generation system
Dissolved gas in oil analysis of various vegetable oils for power transformer applications
Distributed generation protection
Effect of feeder impedance on flicker compliance of induction motor starts
Effect of harmonic filtering on three phase induction motor performance.
Effect of harmonics on the optical characteristics of a differential relay.
Experimental model to determine transformer hotspot temperature
Feasibility study of some local clays for used-dielectric fluid decontamination
Feasibility of HV distribution direct to the consumer's point of supply in urban and suburban areas.
Grounding of power systems
Harmonic analysis of an industrial power distribution network
Harmonic Diversity Factor
Loss reduction in power distribution systems
Mitigation of harmonics in wind turbine variable speed permanent magnet synchronous generators
Network congestion management and pricing of transmission
Non-destructive evaluation of timber power poles
Optimisation of losses in a power distribution network
Optimising automatic reactor and capacitor switching (ARCS) schedules
Power Quality and harmonic audit of a power distribution system
Power System Analysis
Power System instability due to low inertia in a weak power system
Power transmission expansion planning
Probabilistic assessment of lightning strikes and the protection needed in the Western Power Network
Reliability evaluation of a distributed generation system
Short-term load forecasting
Short-term load forecasting in the Sultanate of Oman
Short-term load forecasting of a power system
Stability analysis of a power system
Study of insulating coordination in electric power transmission systems
The impact of different wind conditions on wind power systems
Transformer insulation and heating

Dr Y H Leung
Adaptive noise canceller
Analysis of different implementations of an FFT in an FPGA
Application of signal processing in a communications system
Comparison of the error margin between a 2nd and 3rd generation GPS system
Derivative constrained adaptive beam forming
Design and implementation of an adaptive equaliser
Design and implementation of the FFT in an FPGA
Implementation of an adaptive delay estimator
Implementation of an adaptive FIR filter via an FPGA
Implementation of an adaptive noise canceller using an FPGA
Implementation of an adaptive signal processing algorithm in an FPGA
Implementation of an advanced signal processing algorithm in a Virtex II pro FPGA
Implementation of digital filters using FPGAs
Implementation of fractional delay filters
Simulation study of an OFDM system
Variable fractional delays
Voice over Bluetooth
Wireless data acquisition of EOG signals

A/Prof. M Masoum
A variable speed constant frequency drive for aerospace applications
Active harmonic filter simulation and design
Analysis and implementation of a power converter for electric automobile applications.
Analysis and simulation of a shunt active filter utilising a suitable control technique
Analysis and simulation of static synchronous compensators (STATCOM)
Analysis of field-oriented control in induction motors
Design and construction of a three phase harmonic generator
Design and implementation of a solar water pump using MFFT
Design of a rotor resistance starter for an induction machine.
Direct torque control of interior permanent magnet synchronous motor drives
Flexible alternating current transmission system
Harmonic modelling of induction motors
Harmonic modelling of transformers
Impact of harmonics on the performance of induction motors using a three phase harmonic power supply.
Long term load forecast
Optimal sizing and placement of shunt capacitor banks in distribution systems.
Ride through compensation of industrial drives subjected to voltage sags
Scalar control of induction motors
Smooth starting of a wound rotor induction motor
TCSC; flexible alternating current transmission system

C. Maynard
A base Forth Language and open firmware to be used on the 68HC12 and ARM
Application of computer clusters
Bushfire protection system
Cluster Computing
CUB Brailler
Design of an IP camera
Development of PLC and SCADA lab demonstrations
Open source "Mindtrail"
Optimisation of a traffic light system
Optimisation of winery processing schedules using an evolutionary algorithm
Real-time scheduling analysis
SCADA based simulator for winery production using CITECT software
Self-learning home automation system
Single hand typing interface for people with no hand movement
Software components for the CLIC board
Team maker software
Wireless-based power sensor network

I. Murray
A braille Typewriter
Acoustic imaging
An Application to allow multimodel access to the GSA (Graduate Skills Assessment)
Audio synthesis and recording with the OMAP platform
Braille keyboard
Braille translation
Braille translation - grade 2 forward and back translation
Braille Translation for the Macintosh
Braille translation in Mac OS X
Braille translation; grade 2 forward and back translation
Braille Typewriter
CCTV system for the vision impaired
CISCO router simulation
Colour sensor for the blind
Currency identification for the blind
Implementation of USB ports for an m16C controller
Integration of OpenGL, OpenAL and Open haptics
iView; a classroom aid for the vision impaired
Low vision image enhancer
Multi-channel amplifier
Multi-channel amplifier for a blind telephonist
Music scanner for the low vision musician
Optical recognition and translation of embossed Braille for textual output.
Optical recognition for a braille translation device
Optical recognition of 7 segment displays
Optical recognition of embossed braille
Portable assistive display for the visually impaired.
Remote control and monitoring of multiple outstations over a serial bus
Talking signs
Talking signs (MIRSIGS)
Test environment for haptic shape recognition.
Tethereal for the blind
Text to Braille Converter
Text to speech and LCD interface to Braille typewriter
The white hat hacker
The white hat hacker (wireless)
Translation of sign language to speech
Ultrasonic white cane
Underwater ultrasonic communications
Voice recording via a DSP chip
VoIP analysis and traffic grooming
Wireless communication headset using Bluetooth
Dr D. Myers
3D reconstruction
A neural-fuzzy system for identifying moving objects
A RAID interface
A software monitor for digital television transmissions.
A virtual map of the curtin campus
An on-line tutorial
An SMS software module for an MHP-compliant digital TV receiver
Detecting inflection points in an image
Electronic vermin control system
Infiniband
Neural-fuzzy prediction systems
UML to SystemC conversion

Prof. C. Nayar
A solar home AC system
A wind/diesel hybrid system for Pulan Perhentein, Malaysia
Application of wind generators in Mining
Control and application of a single phase inverter feeding a grid.
Diesel driven double fed induction generator for fringe of grid power conditioning.
Development and testing of a back-up power system
Development and testing of a grid-connected wind system
Development and testing of a mini-grid system
Development and testing of a solar back-up system (SGP-210 )
Development and testing of a solar pump system
Development and testing of SPT MPPT solar charge controller
Doubly fed induction generator
Effect of shading on PV cells.
Electronic load bank design for remote area power supply systems
Energy saving controller
Energy saving lighting controller
Feedback voltage control of voltage source inverters
GPRS based Scada system utilising renewable energy
GPRS-based renewable energy SCADA systems
Grid connected single-phase inverters for wind generation
Grid connected solar power system
Induction generators in a single phase application
Implementation of photovoltaics maximum power point tracking using a microcontroller
Microcontroller based water desalination plant
Modelling and simulation of mismatch in PV cells
Performance analysis of large wind turbines
Performance study of a grid connected residential PV system.
Power quality in a submarine cable using active filters
PV/diesel hybrid systems optimisation
Self capacitor excited induction generators
Simulation and laboratory testing of a hybrid photovoltaic system
Solar home system
Solar/Wind power pack for disaster management.
Testing and verification of Skystream Grid Connection to Australian standards
Testing of IGBT Driver Module
Variable speed self-induction motor

Dr C.Ortega-Sanchez
A household utility monitoring system
Analogue signal laboratory using FPGAs and a PC
Artificial Intelligence Microcontroller
Barcode reader using a microcontroller
Communication protocol for ad-hoc wireless sensor networks
Control of small motors using an embedded system
Design infrastructure of a simple autonomous robot using a microcontroller
Design of a wireless relay
Design of fast reconfigurable FPGAs
Efficient implementation of digital audio processing algorithms using FPGAs
Embedded system using FPGAs
Embedded systems in everyday applications
Extrinsic evolvable hardware using FPGAs
Fast data acquisition system using Xbow wireless sensors
Generation of DTMF tones using an FPGA
Implementation of a DTMF receiver using sliding Goertzel filters
Radio communication using a commercial microcontroller and radio chip
SCADA system for a wireless sensor network
Simple computer assembler and assembler
Sound interface via an FPGA.
Speed measurement using infrared sensors
VGA monitor and keyboard controller using FPGAs
Wireless General Purpose Display
Wireless light dimmer
Wireless robot
Wireless Sensor monitoring

Dr S.Rajakaruna
Control of a Z-source inverter in a solar water pumping application
Control of the output power of a proton-exchange membrane fuel cell
Control of wind turbine driven induction generators using Z-source inverters
Design of a capacitor switched self-excited induction generator for wind powered applications.
Design of a single axis tracking system for a PV array
Design of a solar power system for a building
Design of a voltage-boosting inverter for fuel cell applications
Maximum power point tracking of a field connected PV array using a Z-source inverter.
Series active power filter analysis with renewable source
Sizing of the battery bank of a stand-alone self-excited induction generator driven by a wind turbine.

Prof. J.Siliquini
Automated testing of a telephony system.
Call progress tone detection using FWL digital filters
Design and implementation of a subscriber line interface circuit ( SLIC )
Development of an automated end-to-end system test for a communications product.
Development of embedded firmware for the Coastguard system
Implementation of a VOIP-based mobile phone service
Lab designs using FPGAs
Wireless temperature probe for stroke research

Dr W-Y Yan
Display control of a graffiti robot
Stability analysis of a decentralised networked control system

WATRI PROJECTS

Prof. K. Fynn
An investigation of a functional tester for a new communications product
Digital Line Tester
The programming of an FPGA interface to a VGA CMOS camera

Dr E. Lehman
Data acquisition of audio and video for speaker tracking.
Combination of speaker tracking and beamforming

Dr G Mercankosk
Time transfer over packet networks

Prof. S Nordholm
Blind source separation of speech mixtures
Echo cancellation; robust control of an adaptive algorithm for an acoustic echo canceller
Investigation of a multi-decision, sub-band, voice activity detector
Novel VAD schemes for real-time implementation
On the use of adaptive gain equalisers for speech enhancement applications
Post-filtering noise reduction technique for hands-free communication systems
Robust control of an adaptive algorithm for acoustic echo cancelling
Sensitivity analysis for capacity optimised MIMO systems

Dr Z Zang
Signature waveform set design and simulation for multi-user communications systems

INDUSTRY PROJECTS

Private companies
An automated test system
Calculation and design of power factor correction with harmonic filtering for a copper SXEW Process plant.
Developing a PC-based SCADA/MMI power monitoring system for Pannewonica town and mine operations
Development of an ASM interface for a Yokogawa Operator Interface
Engine misfire detection
Environmental control boards for a mushroom farm
Internet protocol acceleration
Live database redundancy over a distributed network
PDAP Paddington Gold Mine; Input tails electrical installation.
Real-time monitoring of pharmaceutical production
Salt water well automation
Step and touch potential

*Western Power*
Derby Touch, step and transfer potential
Determination of safe step and touch potentials for a HV steel lattice tower
Development of a transient overvoltage assessment tool for power systems
Differential protection of four and more terminal lines
Fabricated poles
Investigation into the cause of damage to electrical equipment and appliances due to inadequate earthing.
Maintenance of SF6 switchgear
Study of lightning over voltage and insulation coordination for Western Power's network
Study of the effects of LFT and EPR on a gas pipeline with respect to a 132 kV line
Ultimate cable layout design in substation trenches.

*Government Departments and Agencies*
Auto calibration of monitors
Investigation and implementation correction within the urban rail system
Live work
Modifying a spectro-radiometer