

CURTIN UNIVERSITY

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

RECENT PROJECTS WITHIN THE DEPARTMENT

Dr A. Abu-Saida

Condition monitoring of power transformers

Application of static phase shifter units in HVDC systems.

Effect of sulphur on transformer solid insulation simulated under accelerated aging conditions

Impact of a load model on power transfer capability of an OLTC

Enhancing power transfer capability using adaptive on line transformer tap changer settings.

Electrical distribution network design for a shopping complex in Kuala Lumpur

Cost study for a power system utility

High frequency transformer model based on distributed parameters

Power control by using a tap changer

A novel algorithm for detecting internal transformer faults

Effect of harmonics on the performance of a relay

A new approach to recognising faults in power transformers using frequency analysis

Dr K-S Chan

QoS routing in a mobile ad-hoc network (MANET)

Providing improved packet transmission through a power line communication medium

Enhancing reliability in unicast mobile and ad-hoc networks.

TCP performance enhancement over MANET

MAC for a mobile ad-hoc network

Prof. K. Chung

Panoramic image capture system.

Development of wireless telemetry system for the Curtin Motorsport team

Development of a panoramic image processing technique from multiple images.

IQ impairment compensation in a DVB-T receiver

Synchronisation of two independently received digital TV signals over the Internet.

Embedded PC implementation of the multiwarp routing protocol

Remote surveillance camera with motion detection

Wireless distance detector

FoIP (Fax over IP) interphasing

IQ compensation in dual branch receivers.

An FPGA implementation of a frequency offset estimation scheme for a DVB-T receiver.

FPGA implementation of a channel equalisation scheme using an FPGA

Mr M. Darby

Prototype of a collaborative learning environment by implementing an intelligent adaptive profiler
An architecture for a collaborative learning environment prototype
Prototype of a collaborative learning environment by implementing an artificial intelligence mentor
Design of a collaborative learning environment through simulation using high-level architecture and run-time infrastructure.
Communications interface between intelligent agents in a high-level architecture system
3D modelling and specification for prototyping aircraft and integration within FDM
Feasibility analysis of an improved monitoring system
Three-dimensional models for simulation-based training analysis

Dr H. Eren

Zigbee based wireless instrument network
Wireless web sensors
Home power monitoring
Investigation of the operation of a passive RFFD
Computerised GPS error control
Wireless network for a PLC
Development of peer to peer communication for an instrumentation system
Remote tracking algorithm using low-cost satellite GPS
Wireless human condition monitoring using wi-fi or Zigbee
Wireless electric motor condition monitoring
Sinusoidal PWM inverter fed induction motor drive for an industrial petroluem plant
Wireless electric motor condition monitoring
Labview in an automated production line
Communication security in power systems.
Monitoring machine health of domestic appliances

Dr R. Howard

Low-noise balanced microphone pre-amplifier
Spectral estimation of Power Spectral Density

Prof. S. Islam

Detection of high impedance faults in a distribution system
Design of a sub-station grounding system
Ultimate cable layout design in substation trenches.
Power transmission expansion planning
Investigation into the cause of damage to electrical equipment and appliances due to inadequate earthing.
Analysis of harmonic effects in the operation of differential relays.
Stability enhancement of distributed power systems with embedded low inertia generators
Maintenance of SF6 switchgear

Study of insulating coordination in electric power transmission systems
Optimisation of losses in a power distribution network
Artificial Neuron Network load flow analysis
Effect of harmonics on the optimal characteristics of a differential relay.
Distributed generation protection
Network congestion management and pricing of transmission
Analysis, modelling and simulation of the Kalgoorlie nickel smelter power systems
Feasibility of HV distribution direct to the consumer's point of supply in urban and suburban areas.
Experimental model to determine transformer hotspot temperature
Short-term load forecasting in the Sultanate of Oman
Stability analysis of a power system
A protection system for an industrial plant.
Reliability evaluation of a distributed generation system
Study of the effects of LFT and EPR on a gas pipeline with respect to a 132 kV line
Transformer insulation and heating
Loss reduction in power distribution systems
Determining the protection adequacy of an islanded distributed generation system
Demand side management of non-essential loads
Harmonic analysis of an industrial power distribution network
Optimising automatic reactor and capacitor switching (ARCS) schedules
Continuity of generation of a distributed generation islanded power system following an emergency
An investigation into the performance of over-current and distance protection schemes on radial distribution systems containing distributed generation
Demand side management in a smart grid
Loss reduction in power distribution systems
Condition assessment of steel sleeved reinforced timber poles
Distributed protection
A probabilistic voltage profile in the presence of embedded wind generation
Analysis of emissions and fuel consumption of power generation systems under varied load

Dr D. Jayaweera

Impact of distributed generators on distance protection
Transient stability assessment of wind farms.
Generic distribution network design
Optimal placement of DAs in distribution networks
State estimation of active distribution networks
Cost-based placement of DGs
Optimal dispatch of a DG in a micro-grid
Protection coordination in a micro-grid
Security constrained interconnection of power plants in a distribution network

Dr Y.H Leung

Location tracking using digital fractional delay

Comparison of the error margin between a 2nd and 3rd generation GPS system

Implementation of an adaptive FIR filter

Implementation of digital filters in FPGAs using distributed arithmetic theory

Design and implementation of the FFT in an FPGA

Simulation study of an OFDM system

Wireless data acquisition of EOG signals

Variable fractional delays

Application of signal processing in a communications system

Implementation of an adaptive FIR filter via an FPGA

Application of signal processing in a communications system

Implementation of an adaptive signal processing algorithm in an FPGA

Analysis of the summe method.

Implementation of an adaptive delay estimator

Implementation of an advanced signal processing algorithm in a Virtex II pro FPGA

Implementation of fractional delay filters

SoC implementation of a noise cancelling filter

Design of Digital Low pass filter with variable cut-off frequency

Finite wordlength effects on variable fractional delay filters

Speech processing with arrays.

Development of a signla processing experiment based on a DSP evaluation module

Robustness of a novel steerable microphone array

Implementation of FFTs in FPGAs; design considerations

Digital crossover networks for loudspeakers

Implementation of FFTs in FPGAs; implementation issues

Noise in industrial data networks

Design and implementation of signal processing algorithms in DSP processors

A/Prof. M. Masoum

Analysis and simulation of a sensorless scalar-controlled of induction motor drive

Analysis of field-oriented control in induction motors

Analysis and simulation of a shunt active filter utilising a suitable control technique

Harmonic modelling of transformers

Design of a harmonic generator for power quality analysis

Design and construction of a three phase harmonic generator

Analysis and simulation of static synchronous compensators (STATCOM)

Optimal design of a renewable apartment complex.

Smooth starting of a wound rotor induction motor

Design of a rotor resistance starter for an induction machine.

Direct torque control of permanent magnet synchronous motor drives

Calculation and design of power factor correction with harmonic filtering for a copper SXEW Process plant.

Design and implementation of a solar water pump using MFFT

A variable speed constant frequency generation in small aircraft

Ride through compensation of industrial drives subjected to voltage sags

Sinusoidal PWM Inverter Fed Induction Motor Drives

Power Smoothing of an induction generator for wind power

Power flow control of power systems with embedded FACTS devices.

Comparison of maximum power strategies in wind turbines

Modelling and simulation of doubly fed induction generators (DFIG) to provide power system support

Reactive power dispatch and voltage control in a practical utility scaled power system

Voltage sag compensation approaches

Analysis on transformer inrush current discrimination and the ultra-saturation phenomenon

Park Model of an induction machine including harmonics.

Impact of shading on the performance of photovoltaic cells.

Analysis on transformer inrush current discrimination and the ultra-saturation phenomenon

Harmonic model of a plug-in electric vehicle (PVE) charger for smart grid applications.

Comparison of derating approaches of distribution transformers serving nonlinear loads

Mr C.A. Maynard

CUB Braille

A base Forth Language and open firmware to be used on the 68HC12 and ARM

SCADA based simulator for winery production using CITECT software

Wireless-based power sensor network

Open source "Mindtrail"

Optimisation of winery processing schedules using an evolutionary algorithm

Team maker software

Design of an IP camera

Self-configuring sensor network

An in-dash multimedia and diagnostics car computer

Scheduling process for wineries.

Expandable sensor array for data acquisition and control of a diesel engine

Dr I. Murray

CCTV system for the vision impaired

Integration of OpenAL audio for a haptics environment

Multi-channel amplifier for a blind telephonist

Braille translation - grade 2 forward and back translation

Test environment for haptic shape recognition.

CISCO router simulation

An application to allow multimodal access to the GSA (Graduate Skills Assessment)

Braille translation in mac OSX

Text to speech and LCD interface to Braille typewriter

Dr D.G. Myers

A software monitor for digital television transmissions.

3D re-construction from uncalibrated images

An SMS software module for an MHP-compliant digital TV receiver

UML to SystemC conversion

Fingerprint analysis

Electronic vermin control system

Prof. S. Nordholm

On the use of adaptive gain equalisers for speech enhancement applications

Investigation of a multi-decision, sub-band, voice activity detector

Robust control of an adaptive algorithm for acoustic echo cancelling

Blind source separation of speech mixtures

FPGA evaluation and implementation of a speech enhancement algorithm

Dr C. Ortega

Design of fast reconfigurable FPGAs

Radio communication using a commercial microcontroller and radio chip

SCADA system for a wireless sensor network

Artificial Intelligence Microcontroller

Fast data acquisition system using Xbow wireless sensors

Design of a wireless relay

Embedded systems in everyday applications

Wireless light dimmer

Data monitoring and supervisory control in wireless sensor networks

Analogue interface module for an FPGA

Sound interface via an FPGA.

VGA monitor and keyboard controller using FPGAs

Analogue signal laboratory using FPGAs and a PC

Efficient implementation of digital audio processing algorithms using FPGAs

Implementation of a DTMF receiver using sliding Goertzel filters

Embedded system using FPGAs

Design infrastructure of a simple autonomous robot using a microcontroller

Barcode reader using a microcontroller

FPGA control scheme for a single phase current control inverter.

Interfacing an LCD with a microcontroller for text and animation display

Wireless robot

Generation of DFTM tones using an FPGA

Control of small motors using an embedded system

Simple computer assembler and assembler

Extrinsic evolvable hardware

Wireless robot

Development of a simulation platform to aid in the evaluation of algorithms for multi-robot swarm systems.
FPGA clusters for image processing
LED Billboard
Development of a modular autonomous robotic platform for educational use.
Dynamic measurement of car fuel efficiency with recording/plotting function
Wireless sensor networks
Environment detecting art
A household utility monitoring system
Wireless General Purpose Display
Communication protocol for ad-hoc wireless sensor networks
Speed measurement using infrared sensors
User-friendly smart-home infrastructure
Signal processing using CPLDs
An embedded system for barcode reading applications
Graphical interface for LED animation
Remote control of a robotic platform using an iPhone
An electronic retina
Cellular automata demonstration system

Dr S. Rajakaruna

Design and implementation of a single phase FPGA control current inverter
Dynamic voltage restorer compensator; the analysis with a renewable source for an industrial park.
Household current harmonics compensation using a shunt active filter
Control of the output power of a proton-exchange membrane fuel cell
Design of a voltage-boosting inverter for fuel cell applications
Design of a single axis tracking system for a PV array
Maximum power point tracking of a field connected PV array using a Z-source inverter.
Control of a Z-source inverter in a solar water pumping application
Sizing of the battery bank of a stand-alone self-excited induction generator driven by a wind turbine.
Design of a solar power system for a building
Control of wind turbine driven induction generators using Z-source inverters
Design of a capacitor switched self-excited induction generator for wind powered applications.
Modelling and analysis of the energy supply system of a fuel-cell plug-in electric vehicle
Control of a Z-source DC-DC converter with an ultra-capacitor bank in a vehicle application
Design of a single phase Z-source inverter
Improving energy efficiency of a RAC Roadside Assistance Vehicle
Design of a fuel cell-based submarine power system
Design and the control of the energy supply system of an electric vehicle supplied by fuel cell and ultra-capacitors
Control and design of DC grids for offshore wind farms
Improvement of grid power quality using fuel cell distributed generators

Design of a Z-source inverter controlled fuel cell - wind hybrid power supply
Design of a superconducting magnetic energy storage system for a wind farm
Design of a single axis tracking system for a PV array
Control of a 3 phase induction motor supplied by a PEM fuel cell stack in an electric vehicle
Design of a reactive power controller for a self-excited induction generator driven by a wind turbine
Demand side management applied to commercial and industrial practices
Improvement of energy efficiency of the Curtin IT facility
Design of a protective device for welding machines to minimise electrocution.
Design of a solar photo-voltaic system for Curtin IT services
Design and simulation of an integrated PV micro-hydro system
Prediction of the performance of a variable-speed self-excited induction generator
Controlling of a two-source inverter in a grid connection of renewable energy sources

Prof. P. Wolfs

PV in Smart grid for electricity distribution in Western Australia
Assessment of back-up feeder protection on the South-west interconnected system
Smart meter home area energy network demonstration/testbed facility.
Impact of charging electric vehicles and plug-in hybrid electric vehicles on power grid frequency and voltage fluctuations

Dr W-Y. Yan

Remote control of a power supply
Stability analysis of a decentralised networked control system
Display and control of a graffiti robot.
Remote control of a power supply