

TERTIARY EDUCATION



University of Queensland / Saint Lucia / Queensland, Australia

Bachelor of Engineering (Electrical)

GPA: 6.0 (Distinction)

Began: March 2014

Completed: November 2017

Awards: **4 x Academic Excellence Awards (Distinction Semester GPA)**
Best Electronics Hardware Project at UQ – 2016

WORK EXPERIENCE – ENGINEERING



APA Group (Brisbane / Queensland)

<http://www.apa.com.au/>

(October 2016 – February 2017) / Full-time

Company: Nationwide Gas Pipeline & Asset Firm

Role: Undergraduate Electrical & Instrumentation Engineer

RESPONSIBILITIES

- ✦ PLC and SCADA system design
- ✦ Safety Integrity Level (SIL) functional management, design, and assignment
- ✦ Designing & constructing RTU PLC test box, for digital and analogue input verification
- ✦ Taking lead on budgeting, designing, and commissioning flame detector setup
- ✦ On-site commissioning of multi-million dollar "Project Eagle" in Moomba, South Australia
- ✦ Designing instrumental trip test procedure for Wallumbilla, Queensland compressor site



Tehnika Pty. Ltd (Brisbane / Queensland)

<http://www.tehnika.com.au/>

(November 2015 – July 2016) / Casual

Company: Control Systems Engineering Firm

Role: Undergraduate Electrical & Computer Systems Engineer

RESPONSIBILITIES

- ✦ Schematic & PCB design, combined with advanced surface mount soldering
- ✦ Voltage level & power efficiency calculations for final products
- ✦ Hardware, firmware, and software design, debugging, and repair



University of Queensland (Brisbane / Queensland)

<http://www.uq.edu.au/>

(July 2016 – Present) / Casual

Company: University

Role: Electrical Engineering Fundamentals / Design Project Tutor

RESPONSIBILITIES

- ✦ Presenting to classes of 80-100 students, teaching principles and fundamentals of electrical engineering
- ✦ Answering specific questions regarding particular topics, within multiple 2-hour tutorial sessions
- ✦ Teamwork with other tutors in order to determine the best approach to presenting classes

WORK EXPERIENCE – NON-ENGINEERING

Throughout schooling and university, I have always strived to broaden my general work skills and emotional intelligence in the workplace through casual jobs. Having worked in a variety of businesses and having experienced a plethora of management styles and systems, I am well disciplined, an effective communicator, extremely flexible, and able to learn quickly; I also work well in team environments as well as independently. In particular, years of experience as an electrical tradesman's assistant gave me the knowledge of the importance of safety, quality control of products, and modularity of systems in regards to electrical engineering. On top of professional roles, I have also been involved in both volunteer work, as well as various leadership roles throughout my time at both school and university (captain of rugby and basketball teams, volunteer tutor, teacher's assistant, school leader).



Tradesman's Assistant

Maranoa Electrical Service | <http://www.maranoaelectrical.com.au>
2010-2016 (on and off, depending on visits to hometown Roma)



Labourer (Casual)

Western Wholesalers | <http://www.westernwholesalers.com.au/>
2012-2013



Stocker & Customer Service (Part Time)

Home Timber & Hardware | <https://www.homehardware.com.au/store/roma/>
2013-2014



Assistant Chairman (Volunteer)

ITEE Student Committee, University of Queensland | <http://www.itee.uq.edu.au/scc>
2017



Electrical Engineering Tutor (Part Time) and Residential Assistant (Full Time)

St. Leo's College within UQ | <http://www.stleos.uq.edu.au/>
2014-2016



Vice-President (Volunteer)

St. Lucia region St. Vincent de Paul Society
2015-2016

REFEREES

WORK

Wade Pan

Senior Electrical & Instrumentation Engineer
APA Group
0403 415 462
wade.pan@apa.com.au

Matt Burey

CEO & Senior Computer Systems Engineer
Tehnika Pty. Ltd.
0437 067 878
matt.burey@tehnika.com.au

PERSONAL

Mark Thornton

Deputy Head of College
St. Leo's College
0412 763 968
m.thornton@stleos.uq.edu.au

Peter Sutton

Associate Professor
University of Queensland
p.sutton@uq.edu.au

HARD-SKILLS

- Tri-specialisation student, focused and experienced in:
 1. **Power Electronics** (power supplies and management, rectifiers, inverters)
 2. **Embedded Systems** (computers, radio and infrared communication, control systems)
 3. **PCB Design** (creating system designs, experience with several CAD software)
- Excessive experience in multiple programming languages, including:
 1. **Python**
 2. **C** (bare-metal ARM and AVR microcontrollers, and Free Real-Time Operating System)
 3. **Java**
 4. **C#**
 5. **VHDL**
- Familiarity and knowledge of international standard for functional safety (**IEC 61508**) for systems:
 1. **Safety Integrity Level (SIL)** of systems
 2. Testing and design of **Safety Instrumented Functions (SIFs)**
 3. Attendance and participation in hazard identification and analysis sessions
- Extensive practice and experience with hands-on testing and design, involving the usage of:
 1. **Multimeters, oscilloscopes, and functional generators** for signals
 2. **Surface-mount and through-hole soldering**, for creation or repairing of PCB systems
 3. **Logic analysers** and **HART communicators**, for testing and diagnosing instrumentation
 4. **LTSpice** and several other software, used to simulate actual circuits and signals in real-time
- General system design skills, including:
 1. **Power management** and efficiency
 2. **Signal and system** interfacing (ADC/DAC fundamentals, filter design)
 3. **Modularity** throughout (hardware architecture layers, multi-threaded programming)
 4. **Perfectionist attitude** – no corner cutting in any constituents of a project

SOFT-SKILLS

- **Ability to function in a dynamical work environment**, that is:
 1. Motivated to take leadership and responsibility if required
 2. Happy and content working as a member of a team, taking direction from a leader
- **Ensuring all measures are taken to ensure safety in all aspects of work**, including:
 1. Always being vigilante and aware of legal procedures and requirements in the workplace
 2. Motivated and eager to implement functional safety considerations in developing products
 3. Advocate for social resolution, when conflict occurs during projects or the workplace
- **Always ensuring the highest self- and group-productivity**, through:
 1. Maintaining and ensuring a positive attitude
 2. Encouraging and practicing a strong work-ethic
 3. Unique combination of both confidence in existing knowledge and skills, as well as having a growth mindset and willingness to take on-board new and alternate options and opinions
- **Great general management skills:**
 1. Ability to channel stress and pressure as a positive motivator to work hard and efficiently
 2. Time-management skills, from both work experience and semesters overloading university
 3. Planning and assigning of tasks in a project setting, for the most effective working procedure

PROJECT PORTFOLIO

The following are all individual projects I have completed, in either a personal, university, or professional environment. Team projects are not shown here, as that may be too excessive and not necessarily reflect my own personal skills.

True RMS Multimeter



- Tasked with designing all hardware (PCB) and firmware (PGA and LCD management on ARM Microcontroller) for a Multimeter
- Given a prescribed acrylic case and tasked with mounting and fitting LCD Screen, Buttons, and PCB to the faceplate
- Included total electrical isolation through optocoupled USB communications
- Featured voltage DC and RMS, current DC and RMS, resistance, continuity, and logic level testing
- Added carbon-fiber aesthetic surrounding
- Highest mark in class for 2017

Educational PCB Thesis Project

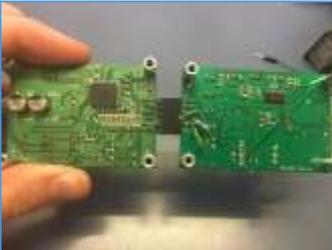
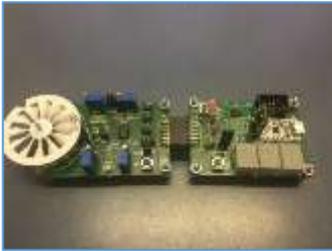


- Final year thesis project at University of Queensland
- Involved topic and design of my choosing, “Educational” PCBs with interactive user interface and hands-on practical teaching of electronics and electrical engineering fundamentals
- Uses LEDs to show current flow, on-board ADC and LCD screen to give current and voltage reading feedback, potentiometers, switches and sockets for user interactivity and the ability to input any resistors
- Battery or USB powered

- 4 different PCBs (‘modules’) targeting different topics of electrical engineering
- On board function generator, plus minus 5V rails, USB-to-PC communication, automatic module detection, and 95% efficiency buck-boost 5V switch mode power supply
- Modules target DC concepts, AC concepts, Operational Amplifier concepts, and Complex Instrumentation and Filter concepts

Scott Williams

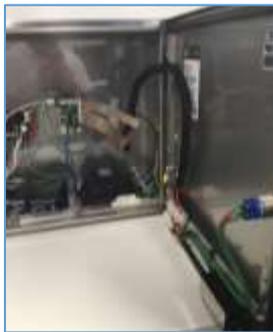
Handheld Weather Station



- Won UQ award for *Best Electronics Project* in 2016
- Various tasks designed and completed by me, including circuit and firmware design for sensors and microcontroller board, as well as PCB design, component sourcing, and through-hole/surface mount soldering, and PC software to interface to
- Utilises two boards, with the 1st (right) being the microcontroller and power supply board, feeding power and reading back measurements from the sensor board (left). These are then displayed on the 3 SSDs, and send to a PC via an FTDI chip; The second board is a temperature, light level, and wind speed sensor, utilising 3 very different styles of analogue sensing all developed by myself
- Advanced features added by myself, which led to winning the award, include:
 1. GPS allowing the ability to later access and view where recordings were taken
 2. Battery low signal, indicating when batteries would soon need replacing
 3. Less than 1% error in readings (only project in class under 5% error), due to excessive circuit stability and calibration

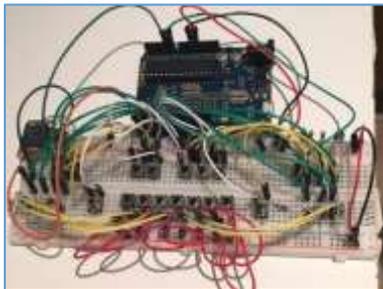
YouTube video I made all about the project here: <https://www.youtube.com/watch?v=qB0UjIHPLfw>

Origin Energy/Tehnika Pty. Ltd Lockbox



- Remotely controlled lockable box/switchboard developed when working at Tehnika Pty. Ltd., as a contract job for Origin Energy
- Utilises a raspberry pi for system input and output over a network web interface, a solenoid as the locking latch, an electrical key enabling manual unlocking of the box, power supply for mains powering, and entire server-client code written for controlling of the box, as well as current status (locked, unlocked, open, closed, latitude & longitude, etc.)
- While at Tehnika, a total of 6 were produced and crafted for Origin which all proved successful.
- LinkedIn article available here: <https://www.linkedin.com/pulse/another-key-success-matt-burey?articleId=6136313721456189440>

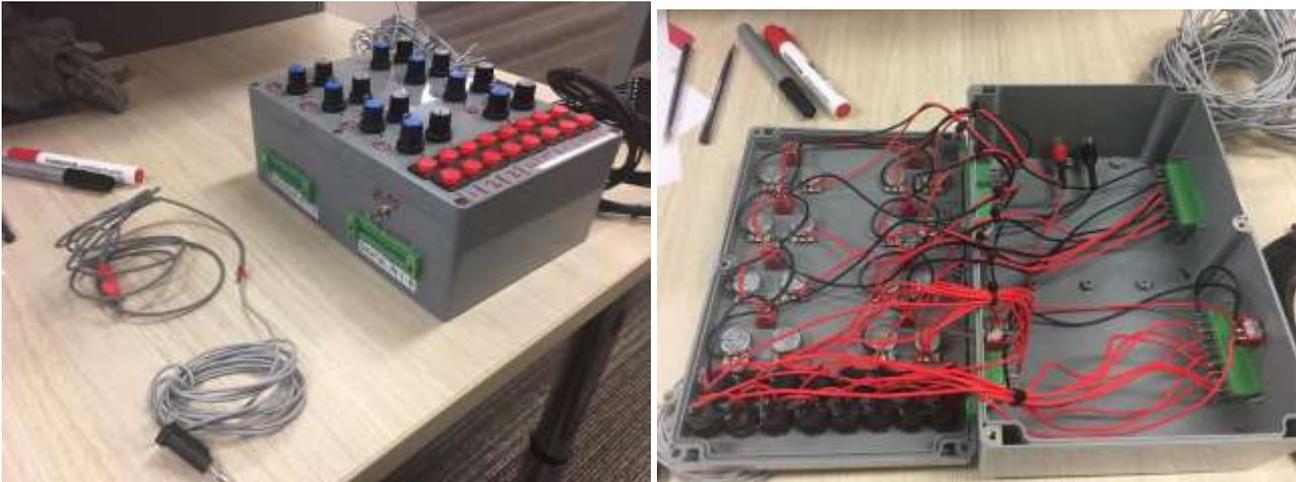
Breadboard/PCB Arduino Piano



- Holiday personal project, began with simple button/buzzer interaction with an Arduino
- Developed to help Nephew learn the basics of piano playing, without my sister risking him not enjoying it and investing in a \$100-200 keyboard he may never end up using more than once
- Eventually developed entire octave, and then two optional buttons to raise and lower it, and then designed a PCB

Scott Williams

PLC / RTU Factory Acceptance Test Box



- Designed, drilled, and soldered by myself from a ABS plastic test box, a variety of potentiometers, buttons, switches, and terminals from Jaycar, this was designed to test PLCs and RTUs which run on an industry standard current loop
- This loop is on a scale of 4-20mA (i.e. for a temperature instrument, 4mA may represent 0 degrees, and 20mA may represent 100 degrees)
- The box thus gives the ability to test PLCs and RTUs analogue (with potentiometer current loops) and digital (with buttons) inputs, without needing complex instrumentation ready to go as test rigs
- One unique feature which was added was the ability to toggle (using a double-pole double-throw switch) was the ability to select whether the inputs would be externally (through 24V plugged into female banana plugs at the front of the box) or internally (through the PLC terminals) powered; this is a setting which may differ between PLCs in the field, set using jumpers on the PCB inside. As a result it was necessary to make the box adaptable to both situations
- Testing was extremely successful due to careful PLC datasheet analysis, breadboarding, and circuit design

Electro-Cardiograph (Heartbeat) Amplifier and Detector



- ECG heartbeat monitor, developed for Medical & Industrial Instrumentation course
- Only 1 revision required
- Included ADC protection, 1000 gain instrumentation amplifier, and 20Hz bandpass filter
- Uses Teensy 3.2 Microcontroller Development platform for heartbeat analysis