Patrick Prell Mechatronic Engineer

Newcastle, NSW 1 +61 458 132 047 prelly95@gmail.com



Hi there! I'm a creative Mechatronics Engineer, talented at finding novel solutions to difficult problems. I offer innovative solutions for embedded systems, hardware design and control systems design. I strive to create robust workflows and exceptional final products.



Professional Experience

Current Aug 2019

Mechatronic Engineer | CORDEL - Australia

- > Developing pose and velocity estimation using optic flow and machine learning for more accurate point clouds. Where I utilised many features of the Open CV library in C++ and created many data visualisations for verification and evaluation.
- > Implementing an Extended Kalman Filter to fuse sensor data, (IMU, RTK GPS, LiDAR) for pose estimation and localisation. This project requires expert knowledge about Bayesian filtering techniques and linear algebra.
- > Spent a year in New York working remotely developing 3D point extraction from 2D camera footage on a train. I demonstrated my ability to work effectively outside of the office environment and without

Python C++ Embedded C C# Rust GraphQL OpenCV Cloud Compare 3D Reshaper Jira Confluence Bitbucket VSCode Visual Studio

Aug 2019 Apr 2018

Technical Officer | Airsight - Australia

- > Implemented pseudo-RTOS to arbitrate commands over the serial port with tasks running in the background.
- > Designed PCB and wrote C/assembly code for status indicator board.
- > Re-designed Base station housing and layout using CAD software. I learned fusion 360 for this task and dramatically improved my industrial design skills.
- > Manufactured aluminium and carbon fibre components on a CNC using CAM software. This is where I fostered many practical skills in material properties, machinist theory and CNC operations/path

Embedded C AVR Assembly Fusion 360 STM32 Cube IDE KiCAD VSCode Git Hub

Current Sep 2019

Founding Member | Borne Clothing - Australia

- > Built parts of our website and fulfilment workflow. This has required me to utilise basic web development skills as well as integrate many different online services.
- > Formulated an algorithm to calculate the distribution of our product range styles to most efficiently order product styles. For this, I calculated the "velocity" of our products selling and used it to determine the required restock rate.
- > jointly responsible for running the business day to day. I am continually learning how to best run a business and social enterprise in the leanest way possible.

Excel Squarespace Shopify Asana

Aug 2018 Nov 2018

ELEC3850 Lab Demonstrator | University of Newcastle

- > This course was the 3rd year major project for Electrical Engineering students.
- > Gave guidance on hardware choices and best practices for electrical/PCB design.
- > Aided students with troubleshooting embedded C code and logic circuits.
- > Helped students consolidate their progress into a final report.

STM32 Eagle PCB Design Embedded C

Aug 2018 Nov 2018

ENGG1003 Lab Demonstrator | University of Newcastle

- > Introduction to Procedural Programming course tutor.
- > Explained concepts to students that they didn't understand from the lectures.
- > Aided students with troubleshooting C and MATLAB code.
- > Invigilated course exams and graided students' submissions.

C MATLAB

Apr 2018 Feb 2018

Creative Technologist | CORE ELECTRONICS - Adamstown

- > Composed maker product review articles (PyCom, Makeblock) where I was required to combine communication excitement and interest with education and information.
- > Documented video tutorials and product overviews Maker community education. Here I improved my public speaking ability and communications in tech.

MicroPyhton PyCom ESP - Esspressive MakeBlock Scratch

SKILLS

Hardware Design 3D CAD design (PTC Creo, Fusion 360), PCB CAD design (KiCad, Eagle)

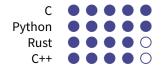
Hardware Manufacturing Soldering(SMD), Prototype Modeling, 3D Printing(FDM, SLA), CNC (Router, Laser cutter)

Embedded Development AtMega23, STM32Fx, Makefile, Embedded C, System Verilog

Software Development Linux (main development environment), Windows, Test Driven Development, Git

Interpersonal Skills Clear communication, enjoy collaboration, inviting to mentorship and constructive criticism

</> Programming Languages





Personal Projects

Advent Of Code - 2021

github.com/Prelly95/AOC2021 Day01 -> Day15 in rust

I have long since been interested in the Rust paradigm and I've dabbled with a few projects here and there. I decided to have a crack at some advent of code problems over the Christmas break.

Rust Logic

Two-wheeled balancing robot

2017

2021

github.com/Prelly95/MCHA3K

Design and development of a self-balancing two-wheeled robot – this required implementation of full state feedback control with a Kalman filter observer @50Hz and was constrained by the hardware of an Atmel ATMega32.

PCB / Circuit Design | Embedded C | Matlab | State Feedback | Eagle

Borne Clothing 2019 - CURRENT

% borneclothing.com

Co-founder and Chief Technical Officer of Borne Clothing, an e-commerce social enterprise that creates sustainably sourced and ethically made mosquito-repellent clothing. We commit to donating 50% of our profit to fund public health interventions that tackle mosquito-borne diseases. My role includes back-end website development and interpreting customer and marketing data to facilitate lean growth

Business Management | Community Development | Social Impact

EDUCATION

30/1/2022 2/2/2022	Vision-Based Navigation Industry Short Course - Dr Chris Renton
Jul 2019 Feb 2015	B.Eng. Mechatronics (Honors) University of Newcastle
Jan 2008 Nov 2013	High School Certificate The Kings School

66 REFERENCES

Aaron Hoye

Chief Technology Officer, CORDEL

@ aaron@cordel.ai

Tom Simmons

Hardware Engineering Manager, CORDEL

tomsimmons@cordel.ai