NICOLAS TRIMBORN

M.Sc. Automation Engineering

Gabelsbergerstraße 103, 80333 München| M: +49 15906349317 |LinkedIn | Email: nick.trimborn@gmail.com

SUMMARY

Experienced Engineer with a broad range of skills and a passion for electronics for robotics applications. Experience in circuit and PCB design, component and system level testing and EMC compliance testing. Strong interest in embedded system design and firmware development both professionally and for personal projects.

Prior career experience in mechanical engineering, with 7+ years in the Mining and Oil & Gas Industry, including 5 years of construction and field engineering experience on large capital Liquefied Natural Gas (LNG) construction projects.

CAREER HISTORY

Franka Emika **Sept 2021 – Present**

Electronics Engineer

Responsible for the development, testing and maintenance of the electronics found in a pioneering TÜV certified collaborative robot. Skilled in the development and testing of electronic components, including power electronics (inverters, motor drives), communications, force/torque sensing and user input. Adept at troubleshooting and problem-solving with a hands-on mentality.

Skills:

- Analog and Digital circuit design and simulation (Altium Designer, Eagle, SPICE)
- Embedded programming (C, C++)
- Familiar with microcontroller from various manufacturers (ARM)
- Communication protocols (EtherCAT, I2C, SPI, CAN)
- Experience with power electronics for brushless motors (inverters and field-oriented control)
- Implementation of automated hardware unit testing frameworks for electronics to enable fault injection and automated firmware testing.
- Hands-on experience in conducting EMC compliance testing. Working knowledge of relevant EMC testing methods and standards for residential/commercial and industrial environments
- 3D Printing prototypes, PCB prototyping, hand assembly and repair, including hot air rework and reflow soldering.

Franka Emika **Nov 2020 – Aug 2021**

Working Student (Electronics)

Working with the electronics department to preform robot testing and troubleshooting. Development of a testing platform to allow for automated unit testing of electronics and firmware during the development stage using Ethercat, CAN bus and standard industrial IO modules.

Skills:

- PCB design with Altium Designer
- Simulink code generation for communication with diverse EtherCat IO modules
- Experience with Python based unit testing frameworks.

JGC Corporation Aug 2015 – May 2018

Global Engineering Company headquartered in Yokohama, Japan. JGC participates in the design and construction of large energy projects.

Mechanical & Piping Engineer | JKC Joint Venture (JGC, KBR, Chiyoda) Ichthys LNG Project (August 2015 - Present)

Overview: As part of a Joint Venture, JGC was commissioned to complete the engineering, procurement and project management for the on-shore process and inlet facilities of the US$34B Ichthys LNG Project (Liquefied Natural Gas) in Darwin, Northern Territory (Australia)

Reporting to the lead engineer in resident engineering department, representing the design office in the field during construction. Interfacing with the construction subcontractor and equipment vendors to identify and address any design or quality issues as well as the review and approval of field changes.

Skills:

- Process plant construction and engineering support experience
- Quality verification, inspection and design verification
- Communication and coordination with subcontractors and vendor representatives
- Field design changes and technical issue resolution
- Exposure to large gas turbine driven turbo machinery, ancillary equipment, pumps and process control equipment
- Working knowledge of Oil and Gas design codes and standards (ASME B31.3, API and NFPA)

BECHTEL **January 2011 – June 2015**

Multi-national provider of engineering, construction and project management services with over 53,000 employees.

Mechanical & Piping Field Engineer | Bechtel Oil & Gas GLNG Project, Curtis Island (November 2012-July 2015)

Overview: Bechtel was commissioned to complete the engineering, procurement and construction stages of the US$18.5B Santos GLNG (Liquefied Natural Gas) project on Curtis Island, Queensland (Australia).

Reporting to the Area Field Engineer and Lead Engineer, managed quantity reporting and progress tracking, inspection, work packaging, quality verification, field changes and system turnover of process piping and utility systems including air compressors, nitrogen generators and water treatment packages.

Skills:

- Field engineering and Construction experience working directly with construction personnel
- Experience with large diameter piping construction and joining techniques.
- Scheduling and work packaging to support construction milestones
- Experience with Pressure testing, flushing and chemical cleaning
- Commissioning and start-up of mechanical equipment packages

Mechanical Project Engineer | Bechtel Mining & Metals (January 2011 - October 2012)

Overview: Bechtel and BHP Billiton established a coal project hub in Brisbane for the planning and execution of numerous Green and Brown fields coal projects in BHP's portfolio in Australia and Indonesia.

Worked on several large mining projects including the Hay Point Expansion Project (Queensland), Crinum M block Study (Queensland) and the Indomet Project (Indonesia).

Skills:

- Front end engineering design, material take offs and engineering studies
- Creating, editing and reviewed technical specifications and purchase datasheets
- Performing design calculations and producing design documents
- Exposure to mechanical handling and coal processing technology.
- Experience with Conveyors, stackers & reclaimers, wash plants, pumps and equipment maintenance facilities
- Technical bid evaluations and vendor document review

BIRCHALL AVIATION **January 2010 – August 2010**

Consulting Engineer

Worked as part of a team to develop a small-scale Vertical Take-off and Landing Air Vehicle (VTOL). Integrating the on-board electronics, power systems, sensors and control system and ground control station.

Skills:

- Exposure to design engineering and the product development lifecycle
- Insight into Team dynamics and project management
- Software programming and embedded electronics design
- Experience with high-speed control loops and control systems
- Development of graphical user interfaces and communications protocols

EDUCATION

Erasmus (Technische Universität München) **April 2020 –August 2021**

Completed exchange semesters at TUM at the faculty of Electrical Engineering. Pursing practical project courses at the TUM with the Munich Institute of Robotics and Machine Intelligence (MIRMI).

Master's Thesis (MSRM):

Topic: Design, implementation and evaluation of an embedded electronic system for the control of a trans-radial prosthesis

- Focusing on electronics design and embedded software to control a trans-radial prosthesis.
- Brushless motor control and joint position feedback, absolute orientation, tactile and bio potential signals.
- Realtime communication with EtherCat.

Projects:

- Cybathlon SS2020 (MIRMI)
  - Part of the student team developing a powered arm prosthesis to compete in the Cybathlon competition organised by the Swiss Federal Institute of Technology in Zurich (ETH Zurich).
  - Focusing on embedded systems on board and control using Simulink. Control was based on inputs from EMG and IMU sensors and brushless motors were used for actuation.
  - Experience with Embedded programming (C and Embedded Matlab coder), PCB design and EtherCAT communication using Etherlab and RT Linux
- Dodo Alive! Resurrecting the Dodo with Robotics and AI (MIRMI)
  - Part of the student team developing components for an autonomous, intelligent walking Dodo-like robot
  - Assigned to the electronics hardware team to develop a motor control boards to drive brushless motors using field-oriented control (FOC) to be used for biped locomotion.
  - PCB design incorporating high performance microcontroller, power electronics, DMS torque sensing and real time communication using EtherCat.

Master of Science, Automation Engineering (Factory Automation & Robotics) **August 2018 – November 2021**

Tampere University. GPA: 4.71/5

Dual degree with major in robotics and minor in factory automation. The program focuses on the fundamentals of robotics, the control of robotics and sensing/perception systems. The factory automation component focused on industrial robotics and application of PLC technology, robot programming and computer vision to solve complex automation tasks. Elective courses were selected to focus on electronic hardware development, embedded programming, real-time Linux applications and robot vision.

Bachelor of Engineering (Honours), Extended Major in Mechatronics Engineering **December 2009**

University of Queensland. Thesis: "Ground Control Navigation and Power Systems for an Unmanned Aerial Vehicle"

Strong focus on electrical, software and control/robotics electives during undergraduate studies. These subjects have stimulated a strong interest in the field of robotics, automation and control system design.

Undergraduate Thesis was completed as part of a team of students who designed and built a fixed wing Unmanned Arial Vehicle to take part in the annual UAV Outback Challenge which draws teams from around the globe. The Thesis was based on work contributed towards the design and implementation of a viable airframe with each student contributing unique ideas to the overall scope of the project.

Awards

- Deans Commendation for High Achievement 2006 & 2009

Internship:

CRC Mining Brisbane **Dec 2008 – March 2009**

Design and construction of an ultrasonic distance measurement sensor for non-contact measurement of hydraulic cylinder extension to be used as part of a system for pose estimation of an experimental automated bucket loader

- Electrical and circuit board design
- Firmware development
- Performance testing and documentation

LANGUAGES

English (Native), German (Fluent)