MATT FAUSS
ROBOTICS ENGINEER

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PERSONAL PROFILE

Creative, multidisciplinary engineer passionate about tackling new technical challenges. Skilled in Object Oriented software development for high level platforms and low-level embedded systems. Mixed signal circuit design. Mechanical design and prototyping.

KEY SKILLS

- C, C++, C#, Objective C, Java, PHP, VB, Python, Keras, TensorFlow
- USB, RS485, CAN, TCP, UDP, WiFi, SPI, I2C
- RTOS, DirectX, OpenCV, Git

- AI, Machine Learning
- Kinematics, Dynamics, Controls
- Solidworks, Altium, Matlab
- Mill, Lathe, CNC

WORK EXPERIENCE

Quartet Mechanics - *Robotics Engineer consultation*   *2012 - Present*

Developed hardware and software for semiconductor manufacturing tools and automation.

Overhead transport system for semiconductor fabs:

- Motion controller and drive for hoist trolley with electric differential for turns
- LIDAR for obstacle avoidance
- Camera synchronized with motion for positioning trolley to station marks with QR code.
- E84 and smart tag interfaces to stations.
- Host server for managing track with multiple hoists as clients over WiFi.

IPGrip - *Software Engineer consultation*   *2014 – Present*

- All software for systems using high-speed cameras and lasers to detect particle size and concentrations in fluid flow in real-time.

ADEM - *Software & Hardware Engineer consultation*   *2010 - 2018*

- End effectors for wafer handling robots
- High performance motion controls with flexible interfaces
- Self-centering edge grippers with controlled holding force, wafer location and cassette mapping sensors, and vortex air cushion
- Wafer Aligners

E Systems / BriteLab - *Software & Hardware Engineer consultation*   *2012 - 2014*

Developed automation and test hardware and software including linear actuator testing system that controls a pneumatic cylinder servo with load cell feedback loop.

Sunstream - Software & Hardware Engineer consultation   2013 – 2014

Developed hardware and software to allow operation of boatlifts over WiFi on mobile devices:

- Network discovery
- Live firmware updates from server
- Encrypted user device registrations purchased from dealers
- Controller uploads data to a server that maintains a database and sends push notifications users
- Developed all the code for the server back and front ends

Handcraft & Irony Wines – Mobile App Development   2012

Developed IOS app for pairing wines using info from XML database and humorous app for adding wine and other embellishments to photos with social media sharing.

Elliott Management Consultants – Software & Hardware Engineer consultation   2012 - 2014

Developed IOS apps for weatherization training and hardware for control of their weatherization test houses over WiFi.

Multimetrixs - Software & Hardware Engineer consultation   2001 - 2010

Worked primarily with scientists to transform lab experiments into marketable products.

- Multi-probe wafer scanning metrology system
- Extensive algorithms for frequency and time domain analysis
- 3D graphical representation of results
- Simulation modes for all hardware
- Benchtop controller for proprietary Resonance Sensor Technology with USB and touchscreen
- Thin film sensor for in-tool CMP process monitoring - Mixed signal design with DDS based excitation up to 500MHz and sense circuitry for low noise, 24bit, RF gain / phase analysis

Smart Machines / Brooks Automation - Senior Software Engineer   1995 - 2001

Developed all the firmware for 3 to 5 axis robot controllers including the following:

- Path planning with optimized trajectories
- Advanced controls with pole placement
- Proprietary language engine with batch scripting and TCL for user extensions
- Intelligent error handling with call trace and system snapshot
- Data types all inherited from base class with methods for streaming
- CANBUS communications to wrist controller
- Laser cassette mapping
- Builds for multiple operating systems
- Simulation modes for all hardware
- Windows data acquisition and controls analysis tools

Responsible for control tuning, diagnosing system problems, metrology, customer engineering support, and on-site installations.

Trust Automation – Engineering Consultant   ***1993 - 1996***

Consulted for clients as an employee of Trust Automation. This included consulting for Smart Machines for six months before being recruited to join their team. Was one of the key employees of Smart Machines when it was purchased by Brooks Automation. Clients and Projects Included:

- **Conner Peripherals**
  Consulted on development of a new technology for hard drive servo track writing. An optical link through a window replaced a physical connection through a hole in the hard drive case to the read/write head. This allowed for servo tracks to be written outside of a clean room. Designed software and hardware to servo the read/write head on interference patterns generated from a reflective diffraction grating attached to the head.
- **Sonic Sensors**
  Development of automotive airbag inflator inspection system for Morton International. System used EMAT ultrasonics to characterize the integrity of inflator welds. My responsibilities included the mechanical design of scanner and PC software for control and data analysis.
- **LAM Research**
  Automation for process tool
- **Davis & Davis**
  Windows application to control 8-axis carpet tufting machine from HPGL designs.
- **JR Johanson**
  Redesigned the electronics and software for 3 types of machines that measure the mechanical properties of bulk solids.

Reisinger Engineering – Mechanical Engineer   ***1991 – 1993***
Mechanical and electrical design of product, tooling, and automation

PERSONAL PROJECTS

30 DOF 6 foot tall Biped Robot
- Motion and sensor control distributed over CAN bus
- Wireless control over LAN
- 3D animated GUI with model converted from Solidworks
- Stereo vision with head tracker

iPod Song Sharing Device
  Transferred selected songs from one iPod to another by detecting the selected song over the serial control port and then reading the file system of the source and writing to the destination iPod using a USB OTG chip from Cirrus.

Hang Glider Camera
  Embedded PC controlled a pan and tilt camera that tracked hang gliders from a hill launch. A palm computer was used to connect to the system and retrieve video wirelessly as a teaching aid for pilots to understand what they are doing in the air.

EDUCATION

Mechanical Engineering – Cal Poly, San Luis Obispo
Programmable Logic Design – Santa Clara University Extensions
Machine Learning – Stanford University (online course)
Deep Learning – Coursera (online course series specialization)