# Eric Douglas Tischer

Electrical & Controls Engineer

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## EDUCATION

Chico State University

Mechatronic Engineering, 2001

Engineering Advisory board member, 2018-present

## HOBBIES

Engine Conversions:
Porsche 914 w. Subaru 2.7L flat 6
MG Midget w. Mazda 1.2L Rotary
VW Passat w. Siemens 90kw EV
Porsche 901 cable shift kit

VW Touareg w. Porsche 958 rear air suspension, PLC controlled

Self-taught MIG & TIG welder

CNC programming (Shapeoko CNC)

Fabricating prototype fiberglass parts

YouTube content creation

Built several electric bicycles

Scuba diving, building underwater camera enclosures

International travel (Chernobyl)

Wedding Photography

## RELEVANT EXPERIENCE

- Designed & built the 90kw, 3 phase drive inverter used in my 2001 VW Passat EV conversion. Home built conversion with 10 years & 90k EV miles so far. (YouTube)
- 18 years of experience as an Electrical and Controls engineer, System Integrator.
- PLC: Allen Bradley ControlLogix; including RSLogix 5000, RSNetworx; Siemens Step 7, Labview, Arduino.
- Motion: Allen Bradley Kinetix 2000-5700, AB Motion Analyzer. Eurotherm/Parker DSE, Fanuc Robotics TP programming, Atlas Copco Torque tools. Coordinated axes servo motion, Web handling, Winding/Tension control, Flying shear, blown film, dispense.
- HMI: Factory Talk View SE/ME, PanelView, WonderWare, Siemens WinCC
- Safety: Certified Machine Safety Expert (TUV). Cat 4 PLe safety system design. Fanuc DCS, AB Control Logix safety PLC, Smart Guard.
- Vision: Developed Machine vision lab while at Tesla. Fanuc IR Vision, Cognex, Keyence Laser Profilometers
- EE: Design and commissioning industrial control panels (NFPA79, UL508A) AutoCAD Electrical, Arc Flash, SCCR… AC/DC Power distribution

## RECENT WORK EXPERIENCE

**Tesla,** *Fremont, CA; Palo Alto, CA; Sparks, NV. Mar. 2011-Jan 2018.*

***Sr. Staff Controls Engineer:*** *D*esign and build manufacturing and test equipment for Tesla's electric Powertrain (battery, motor, gearbox, charger…). I typically worked as the sole Electrical and Controls engineer on projects with a team of Mechanical engineers. Extremely fast paced environment with 99.9% uptime. Member of interview panel interviewing 100+ applicants specifically in technical aptitude. Developed machine vision lab. Member of panel defining Tesla's programming standards.

- *Model 3 Battery Module (Lines 1-3):* Each line contains **168 Axes of Kinetix 5700** servos, 14 PLC processors, 21 racks of Point IO, 2 Fanuc Robots, Cat 4 PLe Safety. I designed all electrical cabinets, system architecture, motor selection. From concept to production I was the sole EE working with 12 mechanical and 6 controls engineers. (2016-2017)

- *Anthill Potting Gantry for Model S 100kwh, Roadster, RAV4, M.Benz B class*: 6 axis servo (4 gantry, 2 dispense). Uses machine vision to locate battery module, inserts a needle and dispenses 2 part epoxy into 100+ holes. Compensates for bent needle, and dimensional variation in injection molded battery modules using Cognex camera. From concept to production I was the sole EE & Controls Engineer. (2017,2011)

- *Robotic battery loader for Grid Storage:* Programmed a Fanuc robot to pick (14) 120lb battery "Pods" and fasten them in a "PowerPack" located using laser measurement and Atlas Copco nut runners. From concept to production I was the sole EE & Controls engineer. (2016)

- *Pack Pulse Test:* Automation connects up to (6) "S/X" battery packs delivered via AGV, applies 180kw bi-directional load to discharge/charge pack for impedance testing. From concept to production I was the sole EE & Controls Engineer. (2015)

- *Supercharger Burn-in tester:* Load tests Tesla Supercharger by supplying 480VAC and absorbing 150kw DC which is recirculated back to the AC input. From concept to production I was the sole EE & Controls Engineer. (2014)

## WORK EXPERIENCE CONTINUED…

**Tesla** *Fremont CA, Palo Alto CA. Sparks NV. Mar. 2011-Jan 2018.*

- *Tesla Portable chiller (40+ built)*: Supplies PID temperature controlled coolant, as well PLC controlled fill and purge functions for testing of powertrain components. From concept to production I was the sole EE and Controls engineer. (2015)
- *Charger Burn-in Tester:* Load tests (9) Tesla chargers by supplying 48A 277VAC and absorbing 450VDC output. 120kw absorbed DC output is converted to AC and fed back into the charger inputs. From concept to production I was the sole EE (2014)
- Rotor Bars cutter (1-2). Picks 12' long copper bars from a conveyor, cuts them to precise length to construct Model S/X motor rotor. 4 axes servo motion, HMI. From concept to production I was the sole EE & Controls Engineer. (2013)
- *Rotor spinner (1-6)* Preconditions "S/X" rotors by spinning them to 17.5k RPM. Reverse engineered motor tuning parameters for Model S stator so an industrial VFD could be used. From concept to production I was the sole EE & Controls Engineer. (2012)
- UV Battery potting (lines 1-5). Glues (444) '18650' battery cells into a top and bottom plastic tray to form a battery module. 11 servo axes, HMI, Safety PLC. These 5 lines ran 100% of battery production for 5 years. From concept to production I was the sole EE & Controls Engineer. (2011-2013)
- Many more projects where I was lead electrical or controls engineer. (Model X roof trim install robot, High voltage robotic microohm resistance checker, Model 3 automated wheel alignment). Perfect safety record (zero injuries) on all projects I worked on.

**Solyndra,** *Fremont, CA.* Feb. 2008-Mar. 2011

***Sr. Control Engineer.*** I designed and built manufacturing equipment for Solyndra's tubular photovoltaic solar panels.

- *Robot Cell controller:* 10 of these systems control the robot workcells and safety hardware which assemble solar panels. From concept to production I was the sole EE. (2009-2011)
- *Tube Transfer System:* 8 of these machines feed every sputtering tool in Solyndra's factory. 8 axis coordinated motion loads 48 tubes in/out of a ceramic fixture for CIGS deposition. From concept to production I was the sole EE and Controls engineer. (208-2010)
- Other projects include Laser glass cutter, ASRS/AGV integration, Helium leak checker.

**Drivex,** *Livermore, CA.* Feb. 2002-Feb. 2008

***Sr. Controls Engineer.*** *Drivex was a small (3 employee) system integrator specializing in web handling, winding/unwinding and tension control systems for military, pharmaceutical, semiconductor, paper, plastic and food industry.*

- Designed electrical panels, PLC and Servo programming for 5 layer blown film line used to make hefty trash bags, salad bags... Cut on the fly & automated splicing system allowed non-stop 24/7 operation. I was the primary EE and Controls engineer.
- Siemens Step 7 PLC and WinCC HMI programmer for 7 chamber vacuum system manufacturing "warm" supercondutors. Was featured in Siemens & Control Engineering magazine. I was a presenter at Siemens Automation Summit 2007. I was the sole EE and Controls engineer.
- Step 7 PLC and WinCC HMI programming for metallic deposition lens coating machine. I was the sole EE and Controls engineer.
- High speed winder, winds 500 foot dry wall tape rolls every 30 seconds. Automatic splicing for non-stop operation. I was the sole EE and Controls engineer.
- Labview Lithium deposition system for manufacturing lithium ion batteries. I was the sole EE and Controls engineer.

**FormFactor Inc.** *Livermore, CA.*

Summer Internship 2000,2001

*FormFactor produces probe cards for "bed of nails" wafer testing.*

- *Design and fabrication of tip replacement tool used to weld a blade to the end of an eyelash sized spring.*
- *Design and fabrication of FFI's "replacement springs" for C4 and T2 product line. Solid modelling and FEA of springs, generating wafer masks, photolithograph of elephant shaped springs on wafers.*
- *Class 100 clean room experience, Bridgeport milling, plastic welders, microscope laser cutting.*