Doug Maly 馬德志

Electrical Engineer

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Hands-On Engineer Specialized in Power Electronics and Motors

Experienced broadly analog circuits, electric machines, and automation. Designed hardware in research environments; applied end use technology to manufacturing on the factory floor. Excellent diagnostic skills. Problem solver. Gained global perspective by self-relocating overseas. Read Chinese and Japanese.

Open to locations in **Croatia, Czech Republic**, **Japan**, and **Taiwan**.

EXPERIENCE

Lead Engineer, Traction Inverter Module (TIM) — **Oct 2017 – Present**
Rimac Automobili – Power Electronics – Zagreb, Croatia

Team lead for the Rimac rear inverter (C_Two hypercar). Supervising team of electrical and mechanical engineers to deliver inverters from blank sheet design to manufacturing.

- Responsible for inverter design: vehicle specifications are 0 ~ 100kph in 1.85sec
- Sourcing custom packages for SiC devices.
- Designing for reliability to meet lifetime requirements
- EMI filter design
- Co-designing capacitor bank and laminated busbars with suppliers

Senior Engineer, Electronics Design — **May 2010 – May 2017**
John Deere – Power Electronics – Fargo, ND

Designed analog power circuits for John Deere flagship hybrid electric 700Vdc inverter. These rugged, four-quadrant inverters drive off-road Big Iron.

- Characterized IGBTs: measured peaks to MWs; automated data processing
- Tuned IGBT gate profiles to optimize 1200V / 600A power transistors
- Performed failure analyses / troubleshooting
- Hand soldered microscopic pitches / built fixtures
- Custom designed SMPS transformer: magnetics and bobbin
- Simulated circuits to conform to safety critical design corners

Consultant — **February 2009 – May 2010**
Self-Employed – Worcester, MA

- Freelance design and reverse engineering
- Rapid prototyping / manufacturing and test

EXPERIENCE *(continued)*

Principal Systems Engineer — February 2004 – January 2009
Allegro Microsystems – Analog ICs – Worcester, MA

Interfaced between customers and IC designers. Wrote datasheets; tested first silicon. Solved customer problems in the field.

- Resolved customer integration issues
- Hand constructed dynamometer for driving electric bicycle BLDC motors
- Designed and laid out printed circuits for demoboards with Cadence
- Supported OEM design and production – including troubleshooting and root cause analysis of circuit malfunctions
- Wrote Mathcad scripts to control oscilloscope and process digitized captures
- Bench work and failure analyses for automotive reliability and ESD test

Senior Design and Test Engineer — November 1998 – January 2004
Ford / Ecostar / Ballard – Electric Vehicles – Dearborn, MI

Lead Engineer: gatedrive in Mercedes Benz NECAR 5 TIM (Traction Inverter Module) using largest 600V IGBTs on the market: Toshiba MG800J2YS50A (org.)

- Lead Manufacturing Test Engineer for custom IGBT module prototype line
- Programmed automated test equipment, octal machine language (TESEC)
- Integrated Tektronix 341A curve tracer with custom hardware into automated tester for power modules using LabVIEW
- Tested leakages with pA meter and 420V short circuits to 8,000A
- Designed and performed artwork with Mentor Graphics and Altium (Protel)
- Debugged and serviced Ford Electric Ranger electric vehicle field failures
- Optimized internal stray inductance using FEM (Ansoft) and hand fabricated hardware – US Patent 6906404
- Developed non-invasive test procedures to determine power transistor on-chip voltage transients – US Patent 6861835
- Invented a current limiter for smart modules – US Patent 6330143

Motor Design — March 1997 – October 1998
United Technologies – Otis Elevators – Bloomington, IN

- Designed first generation AC elevator induction motors with SPEED
- Installed three commercial FEM packages for benchmarking
- Custom built 1000Nm dynamometer using spare elevator parts
- Tested first prototypes of permanent magnet elevator machines
- Authorized by the IUEC to perform manual labor in union shop

EXPERIENCE *(continued)*

Automation Engineer — **May 1995 – March 1997**
Motorola – Crystal Factory – Taoyuan, Taiwan

On the factory floor, I converted manual assembly lines to robotic ones.

- Automated assembly: integrated lasers, sensors and machine vision
- Wrote high level code in embedded systems and ladder logic for PLCs, as well as assembly and proprietary machine languages for robotics
- Customized equipment for RF testing of quartz crystals
- Maintained quick turn schedules for fast paced, high volume factory

Inverter Design and Test — **February 1993 – May 1995**
Industrial Technology Research Institute 工業技術研究院 - Taiwan

- Built low-cost inverters for technology transfer to industry
- Modeled induction machines with home grown C code
- Coded controls for variable speed drives (assembly language)
- Optimized energy storage round trip battery cycles (dynamic programming)

Motor Repair and Re-Design — **December 1991 – January 1993**
Longo Industries – Morris Plains, NJ

Trained to hand-wind stators by Tom Bishop, now Senior Specialist at EASA

- Tested and re-designed industrial machines from 10hp to 10MW
- Scaled up Longo power load capacity by leveraging motor-generators (MG sets), existing DC supply, and second quadrant 480Vac panels
- Re-wrote proprietary source code to fix 800A core tester
- Serviced elevators in the World Trade Center, New York City

EDUCATION

MSEE – University of Wisconsin–Madison – WEMPEC — **1989 – 1991**

- Modeled harmonics for NASA space station motors under D.W. Novotny
- Lectured junior electromagnetic machines and laboratories

BSE / EE – Arizona State University – Magna Cum Laude — **1984 – 1989**

- Taught freshman mathematics and junior motors laboratories

LANGUAGES

English – Native Speaker
Japanese – **METJ** Masters of Engineering, Technical Japanese, UW-Madison
Chinese – Fluent in Mandarin, Reading and Speaking

- Five years university level; summer intensive study at National Taiwan University 臺大

Croatian – Beginner (A2 Level)
Morse Code – 13wpm; ARES licensed amateur: ND1D; USA Department of Homeland Security (DHS) AUXCOMM certified

PUBLICATIONS http://www.DougMaly.com/DouglasMaly_publications.html