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EXPERIENCE

MTSV IV - Mechanical Engineer: Panasonic Avionics Lake Forest, CA: 2015-present

Designed mass-production commercial aircraft products with mechanisms, electronics, etc. Created part and assembly drawings, work instructions, test plans, certification documents, etc.; conducted peer reviews, oversaw & troubleshoot prototype builds. Sourced prototype parts from local vendors, worked with Osaka, Japan-based manufacturing facility to optimize designs for cost-effective precision manufacture/assembly.

- **High-Powered Seat Box:** under-seat power/data distribution hub for seat monitors and charging jacks.
- **Cradle for Passenger Seat Control Tablet:** docking station to mechanically latch and charge specialized tablet, and to provide wireless data to tablet and to passengers' portable electronics.
- **Single Panel Antenna:** 2-DOF under-radome antenna providing passengers with internet, phone service, and live TV. Evaluated manufacturing tolerances, assembly fit, and actuator encoder upgrades.

Sr. Project Engineer: Jabil-CHAD Anaheim, CA: 2015

Upgraded/organized/standardized engineering, CAD, drawing, workflow procedures & processes. Designed public installation for interactive & collaborative flexible automation robot in corporate showcase environment.

Sr. Mechanical Design Engineer: MDA Pasadena, CA: 2005–2011 & 2012–2015

Designed mechanisms, structures, tests, etc. for space and ground programs; wrote assembly instructions; created detailed drawing packages; managed budgets, schedules, trackers, vendors, contractors, and colleagues; conducted tests; oversaw and performed assembly and machining of hardware; inspected parts; acted as CAD resource for colleagues; presented at reviews; gave Lunch and Learn lectures; created in-house documents for CAD procedures and engineering standards; performed stress analyses; mentored.

- **Phoenix On-Orbit Satellite Servicing Robotic Arm: DARPA:** lead mechanical designer (3D CAD, drawings, assembly instructions, trackers) for pair of 7-DOF robot arms 10 feet long.
- **Curiosity Mars Rover: NASA:** Mastcams: lead structure/mechanism/tooling designer; assembly/tuning documents. Robotic arm: drawings, support tool design/test. Cruise stage: assembly tooling design.
- **Phoenix Mars Lander Robotic Arm: NASA:** designed structural components; designed & tested launch lock mechanisms; designed, built, and proof-tested arm static test hardware; oversaw static tests.
- **Mosquito Portable Dynamic Cone Penetrometer: Air Force:** adopted and improved design, built and tested first articles, upgraded for lower-cost/higher-quantity production, created assembly documentation.
- **X-32 Scissor Actuator: ATK Goleta:** designed high-torque, high-precision actuated joints for satellite mechanism, made assembly instructions, assembled delivery units, trained technicians.
- **LSAS and MIDAS Hammer Drill Rock Corers: NASA:** adopted design and drawing package, tracked fabrication, designed and assembled Spirit/Opportunity Mars rover robotic arm tool changer.
- **SUMO FRIEND Satellite Robotic Arm: DARPA:** created interface control and mass documents.
- **GEMS and MACO: JPL/NASA:** performed conceptual packaging design for 2 Mars mission proposals.
- **Featherlite II: No Boundaries:** designed, built prototype, and tested folding/disassembling scooter.

Sr. Product Engineer: WET Sun Valley, CA: 2011–2012

Designed new and upgraded fountain elements, created assembly/installation documentation, conducted life tests, coordinated vendors, performed stress analyses, reviewed designs and drawings, computed product costs, mentored in drawings and GD&T, upgraded procedures, was librarian for classes and data sheets.

- **Aquanura Fountain at Efteling Theme Park, Kaatsheuvel, The Netherlands:** contributed to design of robust pneumatic shutter mechanism for long-distance laminar flow water nozzles.
- **CityCenter, Las Vegas NV:** upgraded compact rotary pneumatic mechanism for water nozzles, tested for wear and corrosion. Designed reliability upgrade kit and technician workbench for submerged lights.
- **Wynn Hotel, Macau, China:** designed and tested submerged LED light, improved performance/size/cost for mass-production, wrote assembly/installation documents; trained/guided techs; managed vendors; designed tubing stands and tool-free sheet metal locking mounts; optimized overseas packing/shipping.
- **Fountain at BAPS Hindu Temple, Chino Hills, CA:** designed serviceable, submerged, distributed computing electronics enclosure to control multiple fountain elements' solenoid coils.
- **The Big Brain Theory, Discovery Channel:** creative development of challenges for reality TV show; created budgets, parts lists, and direction for test runs; was on-camera expert for robot episode.

Applications Engineer: ThinGap Motor Technologies **Ventura, CA: 2002–2005**

- Designed and developed brush/brushless DC electric motors, manufacturing equipment, and assembly tooling for drones, medical devices, power tools, fans, robots, servos, and DARPA Mule.
- Involved in complete process of product design, from initial customer requirements/quotation, to design/manufacturing/inspection/testing/shipping, to customer installation/support.

The Infernolab Robotics: BattleBots, Robot Wars, RoboGames, etc. **1996–present**

- Designed/built/piloted over 21 bots in over 27 competitions. Won 3 times in the 60 lb class (in a field of over 100) of internationally televised BattleBots. Earned over \$60k in prizes, royalties, and appearances.
- Hasbro made a remote control version of champion robot Dr. Inferno Jr., sold in stores nationwide.
- Appeared on TV, radio, magazines, books, newspapers, trade shows, art shows, calendars, and websites. Raised over \$65k in sponsorship products, materials, services, and cash.
- Started robotics business that became profitable in second year. Developed website to document robots, sell products, and provide tutorials. Infernolab YouTube channel has over 3M views & 2.5k subscribers.
- Commissioned by LEGO to build remote control LEGO Mindstorms robots for two E3 trade shows.
- Judge and safety inspector at several events. Gave private and public seminars, and workshops. Helped organize and promote a sell-out event. Acted as robot driver and pit crew for many other teams.
- Puppeteered a robot for 2 episodes of “Grownups” TV sitcom, taped in front of a live studio audience.
- Assisted in department proposals for UCSB undergraduate robot teams and then mentored them.

Movie Special Effects: Mimic and Star Trek: First Contact **Los Angeles, CA: 1996**

Manufacturing Engineer: Dr. Ernst’s Teas (business conducted in French) Luxemburg: 1995

SKILLS

SolidWorks (CAD manager, Certified SolidWorks Professional, Certified Advanced-Drawing Tools & Sheet Metal) Simulation & PhotoView 360, Creo Parametric, Windchill, Agile PLM, ASME Y14.100 & Y14.5M, Geometric Dimensioning & Tolerancing, Machine Shop, MS Office, Photoshop, French, programming.

INTERESTS

Robotics; video game (home and arcade) and pinball collecting, repair, and competition; science fair judging, FIRST/FIRST LEGO League judge and mentor; home improvement; LEGO; car repair, upgrades, and racing; swing dance (performer/teacher); music DJ; cycling; Habitat For Humanity; certified SCUBA diver, comics.

EDUCATION

UC Santa Barbara: Mechanical Engineering - Solid Mechanics and Structures Division.

FAA-funded Ph.D.: “Effects of Surface Preparation on the Long-Term Durability of Adhesively Bonded Composite Joints.” 2002, GPA: 3.5. Student machine shop supervisor for after-hours and weekends.

Cornell University: Mechanical and Aerospace Engineering

Master of Engineering with Manufacturing concentration. Thesis project: “Improving Weld Quality on Aircraft Engine Turbine Blades.” GPA: 3.6. 1993. Biomechanics teaching assistant.

B.S. Senior project: “Ford Hybrid Electric Vehicle.” GPA: 3.2. 1992.

SELECTED PUBLICATIONS AND PRESENTATIONS

“The Evolution of Mars Robotic Arm Technology”, *Robot Magazine*, July/August 2013, pp. 40-41.

(with Daniel Dibiase and Rius Billing) “A Zoom Lens for the MSL [Curiosity] Mast Cameras: Mechanical Design and Development”, *41st Aerospace Mechanisms Symposium*, JPL, May 16-18, 2012.

“How to Design with Composite Materials”, Lunch and Learn Lecture presentation at Alliance Spacesystems, March 6, 2008 and at WET, March 14, 2012.

“Look Ma, No Driver! A Look at the Long Beach Grand Prix”, *Servo Magazine*, August 2008, pp. 49-54.

Technical Editor for Grant Imahara’s book “Kickin’ Bot: An Illustrated Guide to Building Combat Robots”, Wiley, December, 2003.

“A BattleBots Champion Insight,” *BattleBots IQ curriculum*, Ch. 8: “Introduction to Design”, August 2001.

(with Keith Kedward, Jack Bish, and Thomas Tsotsis) “A New Compression Test Fixture for Unnotched or Notched Thin Composite Laminates,” *Journal of Composites Technology and Research*, July 2000.