Derek Lewis Resume

Experience

11/07–present *Mechanical Engineer III* Jet **Propulsion Laboratory** Pasadena CA

- Served as principal analyst and developed high fidelity spacecraft and optical instrumentation models.
- Designed and analyzed composite spacecraft structures to satisfy aggressive weight budget, dynamic requirements and integration constraints.
- Developed dynamic models of large deployable optical system with isolators; calculated wave front and line of site performance to random and transient disturbances.
- Developed thermo-mechanical models of active/passive optics; devised strategies for surface error reduction due to thermal disturbances.
- Developed methodology and investigated failure modes in Mars rover robotic instrumentation.
- Served as principal analyst and developed antenna instrument model for evaluating margins for launch and on-orbit environments against aggressive schedule; advised on design modifications.

3/05 – 10/07 *Senior Engineer* **Lockheed Martin Space Systems Company** Sunnyvale CA

- Served as primary structural analyst and developed detailed finite element models of high performance electro-optical positioning system. Provided key support to design development.
- Developed Craig-Bampton models of electro-optic system for integration; automated checks.
- Performed random response analysis of electro-optical systems: evaluated flexure dynamic loads and Von Mises stresses for load path elements and optical components.
- Developed viscoelastic and tuned mass damper concepts to protect stowed optical mechanism.

8/01 – 3/05 *Engineer* **CSA Engineering** Mountain View CA

- Simulated isolation system for high performance missile guidance application including post-processing code. Designed mass simulator to test isolators, matched test data to model.
- Developed transient analysis of high performance isolation and tuned mass damper system for spacecraft truss structure and MATLAB code to post-process the results of trade studies.
- Developed flexure concepts for guidance system isolation and analyzed stress response to end of travel with nonlinear contact elements.
- Calculated payload response to coupled loads analysis of spacecraft, adapter and isolator.

3/99 – 8/01 *Product Development Engineer* **Seagate Technology LLC** Bloomington MN

- Devised novel micromechanical and fabrication concepts for disc drives; authored 5 patents.
- Designed and tested flight height control devices for product performance and disc testing.
- Authored and presented command shaping paper at Controls Conference of America Hawaii.

6/98 – 8/98 *Student Internship* **Sandia National Laboratories** Albuquerque NM

6/97 – 8/97

- Developed code to control laser vibrometer alignment to structure via finite element grids.
- Authored and presented command shaping paper at the American Controls Conference.
- Performed predictive modeling of National Ignition Facility Target Chamber. Characterized optical port deflections due to fabrication processes for beam alignment.

12/94 – 11/96 *Engineering Analyst* **Modern Engineering** Engineering Analysis Dept. Troy MI

- Developed detailed finite element stress models of complex drive train and vehicle assemblies.

5/94 – 8/94 *Undergraduate Research Assistant* **Pennsylvania State University** Dept. of Mechanical Engineering State College PA

- Developed mathematical model of vibration test rig dynamics for damage mitigation research.
- Developed FORTRAN code to simulate the kinematics and stresses of vibration test rig.
- Authored and presented reports on research to engineering department for discussion.

Education

11/98 **MSME**, Controls and dynamic systems, Michigan Technological University
Thesis: *Suppression of Operator Induced Disturbances in a Rotary Boom Crane*.
Defended thesis and graduated with overall grade point average: 3.78/4.0.

- Authored thesis on adaptive open-loop control of rotary boom crane with nonlinear dynamics.

Derek Lewis Resume

- Coursework in classical and modern control systems; Lyapunov stability, Kalman filters, H_2 and H_∞.
- Maintained graduate computing laboratory, assisted students with research computer needs.

11/94 **BSME**, Michigan Technological University
Graduated *summa cum laude* with overall grade point average: 3.8/4.0.

Skills & Certifications

- Active clearance: **TS/SCI SSBI**.
- Fluent in NASTRAN linear static and dynamic solution methods for isotropic & composite materials.
- Experienced in parametric solid modeling tools: NX 8, Alibre, and SolidWorks.
- Developed expertise in PATRAN and NX 8 for complex model generation and analysis.
- Extensive MATLAB programming experience with jitter/dynamic analysis and parametric FEM manipulation.
- Experience in modeling and diagnosing optical performance due to thermal-mechanical loads; self-taught on SigFit and MATLAB function programming for computing optical figures.
- Trained in MSC ADAMS and NX 8 kinematic simulation software.

Awards

- July 2013 / Team Award / AMD
  Noted for contributions in the validation of large optics for successful integration into test platform.
- August 2013 / Team Award / AOSP
  Performed analysis of complex electro-optical system under severe time constraints and shifting customer goals.
- August 2012 / Team Award / NGIS
  Team developed and delivered new class of imaging spectrometers for Earth science.
- June 2012 / Team Award / NGIS
  Team successfully developed and delivered first three imaging spectrometers to separate customers.
- September 2011 / Team Award / NGIS Instrument
  Performed thermal-mechanical analysis for next generation infrared spectrometer.
- September 2011 / Team Award / MSL SASPaH instrument
  Performed failure analysis and contributed to the successful delivery of flight hardware.
- September 2010 / Team Award / AOSP
  Noted for exceptional contributions leading to a successful program review by customer.
- July 2009 / Team Award / AOSP
  Noted for contributions in design maturation and successful presentation to customer.
- June 2008 / Team Award / AMD DTM
  Noted for efforts in the successful testing of optics, including optical-mechanical analysis.

Publications

- D. Lewis and A. Sannino, “Disc head slider with pole tip spacing de-coupled from slider fly height”, U.S. Patent: **6,697,223**, 2004.
- P. Crane, D. Lewis, Z. Boutaghou and L. Walter, “Microactuator magnetic circuit”, U.S. Patent: **6,671,132**, 2003.
- D. Lewis, D. Schnur, M. Mangold and Z. Boutaghou, “Fly height control slider with crown and cross curve de-coupling”, U.S. Patent: **6,624,984**, 2003**.**
- D. Lewis, W. Bonin, A. Sannino, Z. Boutaghou and L. Knippenberg, “Shear-based transducer for HDD read/write element height control”, U.S. Patent: **6,570,730**, 2003**.**
- Z. Boutaghou, A. Sannino and D. Lewis, “Fly height control for a read/write head over patterned media”, U.S. Patent: **6,501,606**, 2002.
- D. Lewis, G. Parker, B. Driessen, “Comparison of Command Shaping Controllers for a Rotary Boom Crane”, Proceedings of The 1999 IEEE International Conference on Control Applications, Big Island, HI, 1999, Vol. 1, pp.719-724.
- D. Lewis, G. Parker, B. Driessen, R. D. Robinett, “Command Shaping Control of an Operator–in-the-Loop Boom Crane”, Proceedings of The 1998 American Control Conference, Philadelphia, PA, 1998, Vol. 5, pp. 2643-2647.