EMIL J. GEIGER, Ph.D., P.E.

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OVERVIEW: I am a dedicated, versatile engineer with over 15 years of mechanical engineering experience. I have worked in a wide variety of settings including tech start-ups, academia, national laboratories, clean-rooms, plastic manufacturing, and machine shops. Strengths: **Modeling** – able to create effective models of complex problems, **Design and Integration** – from micro to meso scales, **Highly Adaptable** – quick learner and self-educator, **Excellent Verbal and Written Communication Skills** – including across cultures.

CURRENT POSITIONS

Founder and Principal Engineer Geiger Engineering, PLLC 2018-present

- Provide engineering expertise in matters related to microfluidics, experiment design, data analysis, and product development.
- Serve as forensic engineer and expert witness for personal injury legal cases.

Adjunct Professor of Mechanical Engineering University of Nevada, Reno 2016-present

- Serve on graduate student committees as needed.
- Serve on cleanroom design committee for new engineering building.

POSITIONS HELD

Senior Systems Engineer Nevada Nanotech Systems Inc. 2016-2019

- Developed and validated chemometric algorithms to create customer-facing answers from raw sensor signals. Wrote scripts to assemble sensor data from log files, trained physics and statistical based models, prepared algorithms for deployment in sensor system firmware.
- Led MEMS fabrication team responsible for all design work including Finite Element Analysis, CAD, vendor management, and wafer probe testing. Used statistical analysis to identify common failure modes and improve wafer yield.
- Collaborated with marketing team to develop technical sales material and manage customer inquiries.
- Management responsibilities included conducting annual performance reviews and mentorship of early to mid-career engineers.

Assistant Professor of Mechanical Engineering University of Nevada, Reno 2010-2016

- Built microfluidics fabrication laboratory from ground up with focus on dielectrophoresis for cell sorting.
- Secured over $400,000 in grant funding from state and federal agencies including NSF and NASA
- Graduate Students: 1 PhD student and 5 MS students.
- Teaching: Completely redeveloped the Capstone Design Course Sequence (Senior Project) to be a two-semester sequence. Instructed 421 capstone students in 89 teams. Developed a senior elective course, “Introduction to Microtechnology” and contributed to other department teaching needs.
- Service: Editorial Board Member of *Algal Research*, reviewer for a variety of journals, panelist for NSF, active member of the ASME IMECE conference community, organized college-wide Innovation Day.

Post-Doctoral Researcher Lawrence Livermore National Laboratory 2008-2010

- Responsible for designing, fabricating, and testing neural prosthesis components including microfabricated polymer-based electrode array and biocompatible packaging for electronics. Applications include the Artificial Retina project (Dept. of Energy) and general purpose nervous stimulation and recording (NIH).
- Wrote proposals for using polymer-based microsystems for emerging biomedical and energy applications.
- Mentored undergraduate summer interns by identifying projects, providing necessary training, and monitoring progress.

Graduate Student Researcher Mechanical Engineering, UC Berkeley 2003-2008

- In-house expert for projects using plastic injection molding. Key projects include: plastic microfluidic chip fabrication, plastic injection molding for microfluidic packaging, plastic microneedles, and plastic wafer manufacturing.
- Developed plastic microfluidic chips with integrated electrodes and thermally actuated hydrogel valves.
- Worked closely with advisor to write research proposals to DARPA and private industry.

Undergraduate Researcher Microsystems Engineering Team, LSU 1999-2002

- Designed and managed fabrication of injection molding die.
- Produced prototype plastic micro heat exchanger parts and microfluidic devices with hot embossing machine.
- Assisted graduate students with various design projects such as vacuum chambers, injection molding dies, and electroplating fixtures.

EDUCATION

Ph.D. in Mechanical Engineering University of California, Berkeley 2008
Advisor: Professor Albert P. Pisano
Dissertation: "A highly-integrated, polymer-based microfluidic chip for disposable applications."

M.S. in Mechanical Engineering University of California, Berkeley 2006
B.S. in Mechanical Engineering Louisiana State University, Baton Rouge 2003

SKILLS

Computer Languages: Matlab, Git, Python, JMP scripting
Software: Fusion 360, Solidworks, Autocad, Pro/Engineer, L-Edit, Mastercam, Simscale, Comsol, Moldflow, Labview, Microsoft Office, Coreldraw, Latex.
Microfabrication: Lithography, furnaces, plasma etching, thermal evaporators, PVD sputterers, wafer bonder, injection molding, hot embossing.
Machine Shop: Mill, lathe, CNC equipment, sheet metal design and fabrication, printed circuit board design.

NOTABLE JOURNAL PUBLICATIONS

- H. Hadady, D. Redelman, S. R. Hiibel, **E. J. Geiger**, "Continuous-flow sorting of microalgae cells based on lipid content by high frequency dielectrophoresis," *AIMS Biophysics* Vol. 3 Iss. 3, 2016, pp. 398-414.
- M. Higgins, **E. J. Geiger**, "Epifluorescent direct-write photolithography for microfluidic applications," *Journal of Micro/Nanolithography, MEMS, and MOEMS,* Vol. 14 Iss. 1, 2015, pp. 013504.
- H. Hadady, J. J. Wong, S. R. Hiibel, D. Redelman, **E. J. Geiger**, "High frequency dielectrophoretic response of microalgae over time," *ELECTROPHORESIS*, Vol. 35 Iss. 24, 2014, pp. 3533–3540.
- J. Malinowski, **E. J. Geiger**, "Development of a Wireless Sensor Network for Algae Cultivation using ISFET pH probes," *Algal Research*, Vol. 4 No.1, 2014, pp. 19-22.
- **E. J. Geiger**, A. P. Pisano, and F. Svec, "A Polymer-Based Microfluidic Platform Featuring On-Chip Actuated Hydrogel Valves for Disposable Applications," *Journal of MicroElectroMechanical Systems*, vol. 19, 2010, pp. 944-950.
- D. A. Mair, **E. J. Geiger**, A. P. Pisano, J. M.J. Fréchet, and F. Svec, "Injection molded microfluidic chips featuring integrated interconnects," *Lab on a Chip*, vol. 6, 2006, pp. 1346-1354.

COMMUNITY SERVICE ACTIVITIES

1. Board Member Edgewater HOA, 2017-present.
2. Member of Board of Directors for Regeneration, a community non-profit, 2009.
3. Monthly speaking engagements with community youth group, 2000.