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Jennifer A. Doyle

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EDUCATION

Massachusetts Institute of Technology, Cambridge, MA — Graduation Date: June 2009
Bachelor of Science in Mechanical Engineering, GPA: 4.7/5.0
Thesis: *Analysis and comparison of metrology methods for quantifying micro-endmills*

PROFESSIONAL EXPERIENCE

Lawrence Berkeley National Laboratory, Berkeley, CA — February 2011 – Present
Mechanical Engineer

APEX Project Design and Fabrication

- As engineer responsible for design of the APEX Phase II buncher main cavity, currently using a multi-step electromagnetic-thermal-structural FEA process to characterize operation frequency and tuning performance and develop sufficient cavity cooling
- Led successful conception, design, and thermal analysis for the APEX project's Phase I/II two-slit emittance measurement system, designing adequate cooling to maintain desirable temperatures and prevent 20-micron slits from closing due to thermal expansion
- Supervised and assisted in fabrication, precision assembly, alignment, and installation for the emittance measurement system, resulting in fully functional operation on the very first attempt in November 2013
- Directed all aspects of design, analysis, fabrication, and installation of the APEX beam dump system, in use since Phase 0 with demonstrated capability to withstand the thermal load of the beam

Seismic Loading and Anchoring

- Calculated seismic loading and selected appropriate anchors per California Building Code standards for diverse lab equipment up to 9500 kg in weight, including situations involving unique implementation challenges, and oversaw prep-work and installation in collaboration with multiple project groups
- Proposed and implemented design changes to assemblies when necessary to reduce seismic loading and simplify anchoring requirements
- Created full-scale anchoring layout plots of large-scale items to provide a precise and easy way of indicating anchor hole drilling locations, despite previous unsuccessful attempts by others

CMM System Repurposing and Magnet Field Mapping

- Gained proficiency in both manual and DMIS command programmed CMM operation in order to successfully repurpose an abandoned, outdated CMM as the driving device for a magnetic field mapping system
- Programmed a flexible LabVIEW routine to acquire and correlate probe position from CMM encoders and an interferometer with magnetic field data from one or more probes, including multi-axial and multi-channel probes with a variety of communication formats
- Despite significant operating system limitations, developed an effective solution to data acquisition timing, allowing repeat sampling at particular positions or use of probes with slow sampling rates
- Mapped and measured field profiles and excitation curves for a variety of magnets, including corrector, sweep, dipole, and quadrupole magnets for the APEX project using repurposed CMM system
- Trained users in other projects to operate the system and remained on-call for solving challenging measurement applications; regarded as the subject matter expert for CMM-based magnet measurements

Vibration Studies

- Conducted more than fifteen vibration measurement campaigns at various locations across the Lab in support of multiple groups in collaboration with subject expert as well as independently
- Increased study efficiency and throughput by programming scripts to pre-load accelerometer database information and setup data acquisition software, schedule and automatically trigger measurements, and export and execute preliminary analysis and graph generation

UNDERGRADUATE RESEARCH

MIT Media Laboratory, Hyperinstruments Group Summer 2008

- Designed and fabricated a piano that uses electromagnetic guidance to teach users how to play the instrument
- Created detailed CAD models of 52 key piano set-up and guidance mechanisms

MIT BioInstrumentation Laboratory Spring 2008

- Co-designed a microcalorimeter fluid handling system for pharmaceutical drug development
- Developed and tested the hardware/software interface controlling fluid injection and temperature control

MENTORING AND TEACHING

MIT Women's Technology Program in Mechanical Engineering, Cambridge, MA Summer 2006/2007
Academic Tutor (2007), Residential Assistant (2006)

- Introduced female high school seniors to mechanical engineering and college life in a residential academic summer program
- Taught an introduction to MATLAB and MATLAB programming, supervised hands-on laboratory and design activities, and provided tutoring on a variety of mechanical engineering topics

Techbridge, Chabot Space & Science Center, Oakland, CA Summer 2005/2006
Intern

- Co-authored a college application guidebook aimed at high school girls in the Techbridge program and assisted in production of an activity and guide to writing college personal statements
- Participated in role model events and mentored younger students in the program

SOFTWARE AND FABRICATION CAPABILITIES

- **CAD/CAM/drafting**: CoCreate/Creo Elements Direct, SolidWorks, Pro/ENGINEER, hand/table drafting, GD&T (ASME Y14.5M-1994)
- **Technical Software**: ANSYS (Workbench and Classic), LabVIEW, Mathcad, MATLAB
- **Other Software**: Adobe Photoshop, Illustrator, Flash; Microsoft Excel, Powerpoint, Word
- **Programming**: HTML, basic Java and C++
- **Hands-on/fabrication**: Machine shop tools, water jet cutting, intermediate TIG welding (steel and aluminum); basic experience in metal casting (sand and ceramic shell molds), MIG welding, and stick welding

PUBLICATIONS

Journals:

- Sannibale, F., Filippetto, D., Papadopoulos, C.F., Staples, J., Wells, R., et al (including Doyle, J.). *Advanced photoinjector experiment photogun commissioning results*. Physical Review Special Topics – Accelerators and Beams 15, 103501 (2012).

Conference Papers:

- Sannibale, F., Filippetto, D., et al (including Doyle, J.A.). *Recent Results from the APEX Gun Project at LBNL*. In *Proceedings of NA-PAC 2013* (709-713).
- Sannibale, F., et al (including Doyle, J.). *Status of the APEX Project at LBNL*. In *Proceedings of IPAC 2012* (2173-2175).
- Filippetto, D., et al (including Doyle, J.). *APEX Initial Commissioning Results*. In *Proceedings of FEL 2012* (337-344).

MEMBERSHIPS

- Pi Tau Sigma Mechanical Engineering Honor Society

OTHER INTERESTS

Outside of my professional work, I apply my fabrication skills to making art in a variety of media and have displayed at the following shows:

- Playing with Fire: The Art of Making Glass; hosted by the Oakland Museum of California and exhibited at the Oakland International Airport; Oakland, CA (2012-2013)
- Student Glass Art Show; Studio One Art Center; Oakland, CA (2011)
- 22nd Annual California Conference for the Advancement for Ceramic Art (CCACA); hosted by the John Natsoulas Center for the Arts; Davis, CA (2011)
- Annual and "Honors" Student Art Shows; Diablo Valley College Art Gallery; Pleasant Hill, CA (both 2010)