Scott Egbert

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SKILLS

Optomechanical Engineering | Experimental Optical Diagnostics | Scientific Computing

CAD: SolidWork (5 yrs), CATIA (2 yrs), NX (2 yrs)
Programming: Python (7 yrs), MATLAB (4 yrs), Arduino (3 yrs)
Fluent in Spanish: Argentina (2 yrs)
Communication: Public speaking, management, scientific writing
MS Office: Excel (10+ yrs), PowerPoint (10+ yrs), Word (10+ yrs)
Bowling Champion: QUADMARTS Conference 2023

EDUCATION

PhD Mechanical Engineering | University of Colorado, Boulder, CO — Dec 2023
Enabling High-Temperature Measurements with Frequency Comb Laser and Spectral Database Development
Advised by Dr. Greg Rieker in the Precision Laser Diagnostics Lab, funded by AFRL

MS Mechanical Engineering | Brigham Young University, Provo, UT — Aug 2019
Pressurized Combustion Product Temperature Measurement Using Integrated Spectral Band Ratios
Advised by Dr. Dale Tree, funded by Solar Turbines

BS Mechanical Engineering (Magna Cum Laude) | Brigham Young University, Provo, UT — Jun 2017
Teaching Assistant (TA): Physics II: Thermodynamics and Optics; Mechanical Engineering Thermodynamics

RELEVANT WORK EXPERIENCE

UNIVERSITY OF COLORADO, BOULDER, CO | Research Assistant (RA) — Aug 2019 – Dec 2023

- Designed and built a compact and **fieldable IP-DFG mid-IR DCS** (Dual Comb Spectrometer) using **SolidWorks**
- Interviewed, trained, and managed four undergraduate interns to support design and testing of the mid-IR DCS
- Wrote **Python** wrapper with a GUI to interface with a legacy JPL Fortran spectral database optimizer, reducing the processing time for the 58 200,000 point data sets by multiple orders of magnitude
- Updated up to spectral 12 parameters each for over 6,000 water absorption features in the HITRAN spectral database, optimizing the spectral model for combustion and exoplanetary measurements

SANDIA NATIONAL LAB | R&D Graduate Summer Intern — Summer 2018

- Rewrote legacy **Python** code to process Raman concentration measurements from experimental releases of LN2
- Compared results to those of compressed natural gas and hydrogen in a formal report that was later published

BRIGHAM YOUNG UNIVERSITY, PROVO, UT | Research Assistant (RA) — Mar 2017 - Aug 2019

- Coordinated and conducted three test campaigns at Solar Turbines (San Diego, CA) to optically measure gas temperature using water vapor emission from combustion products at turbine rotor inlet (results)

LOCKHEED MARTIN AERONAUTICS | Aeronautical Engineer Intern — Summer 2015 and 2016

- Investigated design improvements to F-35 flaps, proposed solutions, and incorporated design changes
- Designed satellite transmitter/receiver assembly, coordinated manufacture and installation in F-35 flying testbed

SELECTED PUBLICATIONS, PRESENTATIONS, PATENT

PUBLICATIONS

- **S.C. Egbert**, K. Sung, S.C. Coburn, B.J. Drouin, G.B. Rieker, "Speed-Dependent Voigt Lineshape Parameter Database Using Dual Frequency Comb Laser Absorption Measurements of Pure and Air-Broadened H_2O From 6500-7800 cm^{-1} and up to 1300 K," In Preparation, 2023.
- N. Hoghooghi, P. Chang, **S.C. Egbert**, ... S.A. Diddams, and G.B. Rieker, "Complete reactants-to-products observation of a gas-phase chemical reaction with broad, fast mid-infrared frequency combs," 2023.

PRESENTATIONS

- **S.C. Egbert**, S.C. Coburn, K. Sung, B.J. Drouin, G.B. Rieker, "High-resolution Dual Comb Spectroscopy to Validate High-temperature H_2O Absorption Models," Conf. on Lasers and Electro Optics (CLEO), 2023
- **S.C. Egbert**, P. Chang, S. Diddams, G.B. Rieker, N. Hoghooghi, "High-Speed, High-Resolution, Broadband Dual-Comb Spectrometer From 3-5 μm," Int. Symposium on Molecular Spectroscopy (ISMS), 2022

PATENT

D. Zeltner, D.R. Tree, M. Rezasoltani, **S.C. Egbert**, "Temperature Measuring System", Optical Radiation Pyrometry Technique for Gas Turbine Engines, United States Patent 11215508, 2022