David Bauer

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QUALIFICATIONS SUMMARY

I am a biophysicist with 7 years of research experience in academia and industry, where I have focused on building hardware and software tools to answer scientific questions. I have experience in machine learning, data and image analysis, and software development.

EDUCATION

UNIVERSITY OF CALIFORNIA, SAN FRANCISCO
Ph.D. Biophysics *2015 - 2020*
UNIVERSITY OF CALIFORNIA, BERKELEY
B.A. Physics *2007 - 2011*

RESEARCH EXPERIENCE

University of California, San Francisco – Biophysics Department
Postdoctoral Scholar *2020*
Graduate Student *2015 - 2020*

- Analyzed 3D image data to measure flagellar lengths, resulting in the detection of novel statistically significant noise; Results submitted to *Current Biology*
- Designed and fabricated a microfluidic device for high throughput imaging of *Chlamydomonas* flagella to study organelle size control; Enabled critical flagellar regeneration experiments
- Collaborated with lab members to design and fabricate a microfluidic device for long term imaging of *Stentor* to study cell size control; Enabled critical size control monitoring experiments
- Used Amazon's Mechanical Turk to train machine learning algorithms to pick particles from Cryo-EM images; wrote software to optimize output from users on Mechanical Turk; results published in *Nature Methods*

Calico Life Sciences
Consultant *2019 - 2020*
Intern *Fall 2018*

- Integrated microscopy hardware components and microfluidics in Python for custom microscopy setup
- Wrote software to identify targets using computer vision
- Built a single-shot autofocus using deep learning, resulting in faster and more reliable imaging

University of California, San Francisco – Pharmacology Department
Assistant Specialist *2013 – 2015*

- Designed and built an illumination system to deliver optogenetic pulses of light with precise temporal and spatial resolution; results are published in *Cell Systems*
- Designed and built a compact phase contrast microscope capable of studying neuronal stem cell differentiation with live image analysis and feedback
- Built a computer and wrote software in MATLAB to control data acquisition, stage position, and illumination

Lawrence National Laboratory – Astrophysics Department
Research Associate *2011 – 2013*

- Analyzed solar eclipse data to determine accurate stellar positions
- Designed curve-fitting algorithms to process star locations
- Performed error analysis for lens asymmetry, change in focal length, chromatic aberration, etc

University of California, Berkeley – Physics Department
Lab Assistant *Summer 2011*

- Reverse engineered and debugged a curve tracer program and educational signal processing and noise generating program (LabView)
- Analyzed specs, performed cost-benefit analysis, and upgraded documentation in order to implement a new Cd-Te X-Ray detector
- Tested various lab equipment, ranging from waveform generators to high voltage power supplies to avalanche photo diodes, for lab experiments

University of California, Berkeley – Police Department
Software Developer *2012 – 2013*

- Developed a program in C that reduced the workload of dispatchers and influenced day-to-day operation
- Responsible for developing a new database using Visual Basic for Applications and SQL
- Analyzed data and prepared reports for non-technical supervisor

SKILLS

- **Languages/OS:** Python, C, C++, Matlab, LabView, IDL, Microsoft Visual Basic, Linux/Unix, CAD

PUBLICATIONS

David Bauer, Hiroaki Ishikawa, Kim Wemmer, Wallace Marshall. "*Biological Noise in an Organelle Size Control System*", submitted for review. *Current Biology* 2020
bioRxiv preprint*:* https://www.biorxiv.org/content/10.1101/2020.08.31.276428v1

David Bauer, Tatyana Mashukok, Wallace Marshall."*Building New Tools to Measure Noise in Organelle Size Control"* Doctoral Dissertation, University of California - San Francisco. ProQuest Dissertations Publishing. June 2020.

Alex J. Hughes , Joseph D. Mornin, Sujoy K. Biswas, Lauren E. Beck , **David P. Bauer**, Arjun Raj , Simone Bianco , and Zev J. Gartner, *Nature Methods. "Quanti.us: a tool for rapid, flexible, crowd-based annotation of images"* VOL 15. August 2018. 587–590

Cameron Sokholic, Yanxia Lui, **David Bauer**, Jade McPherson, Michael Broeker, Graham Heimberg, Lei S. Qi, David A. Sivak, and Matt Thomson, *Cell Systems.* "Transcription Factor Competition Allows Embryonic Stem Cells to Distinguish Authentic Signals from Noise" Vol 1, 117–129, August 26, 2015