Andrew D. Mullen

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SUMMARY

- Engineering leader with 10+ years of experience advancing imaging, sensing, and robotics on NASA and NSF projects.
- Led the development of robotic payloads integrating optics, computer vision, electronics, and mechanics.
- Designed and deployed systems in harsh environments, including deep-sea, polar, and planetary analog settings.
- Managed full engineering lifecycles, from concept and prototyping to fabrication, deployment, and data analysis.

EDUCATION

2018	Ph.D.	Electrical Engineering	University of California San Diego
2015	M.S.	Oceanography	University of California San Diego, Scripps Inst. of Oceanography
2011	B.S.	Civil Engineering	University of Notre Dame, *Magna Cum Laude*

PROFESSIONAL EXPERIENCE

2022-2024 Senior Research Engineer / Visiting Research Scientist, Cornell University

- Led design and fabrication of NASA-funded sensor package for deep-sea robotics. Developed electromechanical systems (pressure vessel, embedded computer, DAQ board, power regulation) and software including real-time data visualization pipeline using Python. Coordinated teams over 10 ROV deployments mapping fine-scale ocean features
- Lead field engineer on Arctic studies, testing geophysical sensors on mobile platforms for planetary analog research.

2019-2021 Imaging & Robotics Engineer (Postdoctoral Fellowship), NASA & Georgia Institute of Technology

- Engineer on NASA-funded underwater robot *Icefin*. Collaborated with interdisciplinary team to test, develop, and deploy vehicle which integrates multiple sensors (optical, sonar, imu) with battery power and actuation. Conducted three Antarctic campaigns (38+ weeks total), contributing to 50+ robotic missions studying sub-ice environments.
- Led collaboration with NASA JPL developing an autonomous submersible microscopic. Designed embedded optics, electromechanics, and computer vision image processing. Deployed in Antarctica as an analog for ocean worlds.
- Co-led 21-member team to design a conceptual multi-instrument payload design for future NASA Europa missions.

2012-2018 Imaging & Ocean Instrumentation Engineer (NSF GRFP PhD Fellowship), UC San Diego

- Developed custom underwater imaging systems with embedded optics, computing, and electromechanical elements.
- Directed 90+ deployments utilizing robotics and scuba, led technical teams and resolving real-time challenges.
- Built computer vision pipeline for particle tracking velocimetry and collaborated on machine learning classification.

MANAGEMENT & OPERATIONS

- Management: defined requirements, coordinated stakeholders, created timelines, led rapid development cycles
- Engineering Integration: Directed subsystem design, manufacturing, and validation from units to integrated system.
- Field Operations: Managed logistics, planning, and coordination for deployments using underwater robotics, marine vessels, and diving. Completed 15 campaigns across Antarctica, Arctic, Red Sea, Caribbean and Pacific regions.

TECHNICAL SKILLS

- Computing: computer vision, image processing, data analysis, signal processing [Python, OpenCV, Matlab]
- Optics: imaging system design, computational imaging, microscopy, optomechanics, optoelectronics [Zemax]
- Mechanics: mechanical structures design, pressure housing, robotic payloads [SolidWorks, 3D Printing]
- Electronics: embedded cameras, sensors, computers, microcontrollers, PCB design [Eagle, Python, Arduino]

PUBLICATION & AWARD HIGHLIGHTS

- Peer-Reviewed Journals: *Nature, Nature Communications, Science Advances, Nature Geoscience, Planetary Science*
- Media Coverage: *New York Times, BBC, Washington Post, Wall Street Journal, PBS, Scientific American*
- Awards: Antarctic Service Medal, NASA Postdoctoral Fellowship, NSF Graduate Research Fellowship (2012), Microscopy Today Innovation Award (2017), Link Ocean PhD Fellowship (2014), UC Regents Fellowship (2011)