Daniel Hellfeld, Ph.D.

CONTACT

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SUMMARY

Applied research scientist leveraging computer vision and machine learning techniques to solve complex inversion problems. 5+ years experience in developing, testing and deploying software for anomaly detection, image reconstruction and real-time 3D mapping.

EDUCATION

Doctor of Philosophy (Ph.D.), Nuclear Engineering (4.0/4.0) — **Aug 2015 - Jul 2019**
University of California, Berkeley — *Berkeley, CA*

- Thesis: "Free-moving Omnidirectional 3D Gamma-ray Imaging and Localization"

Master of Science (M.S.), Nuclear Engineering (4.0/4.0) — **Aug 2013 - May 2015**
Texas A&M University — *College Station, TX*

- Thesis: "Feasibility of Remote Nuclear Reactor Antineutrino Directionality via Elastic Electron Scattering in the WATer CHerenkov Monitor of ANtineutrinos (WATCHMAN)"

Bachelor of Science (B.S.), Physics (3.89/4.0) — **Sep 2009 - Jun 2013**
University of California, Santa Barbara — *Santa Barbara, CA*

RESEARCH EXPERIENCE

Senior Scientific Engineering Associate — **Aug 2019 - Present**
Applied Nuclear Physics Group, Lawrence Berkeley National Lab — *Berkeley, CA*

- Real-time 3D mapping with contextual and radiological data streams.
- Object detection and tracking in LiDAR point clouds with sparse CNNs.
- Anomaly detection algorithm development for a city-scale network of multi-sensor systems.

Research Fellow — **Nov 2014 - Jul 2019**
Nuclear Science and Security Consortium, UC Berkeley — *Berkeley, CA*

- Novel experimental demonstration of real-time omnidirectional 3D active coded mask imaging.
- Fusion of contextual sensors and computer vision with gamma-ray image reconstruction.

Physics Intern — **Jun - Aug 2015/2014**
Rare Event Detection Group, Lawrence Livermore National Lab — *Livermore, CA*

- Monte Carlo simulations and statistical data analysis for a proposed antineutrino detector.
- Studied the feasibility of remote nuclear reactor directionality with electron scattering.

TEACHING EXPERIENCE

Lecturer, NE 104, NE 107 — **Jan - May / Sep - Nov 2018**
Department of Nuclear Engineering, UC Berkeley — *Berkeley, CA*

SCIENTIFIC COMPUTING SKILLS

Languages:	Python, C++, bash
Machine Learning:	PyTorch, TensorFlow
Build Systems:	make, CMake, ninja, catkin
Operating Systems:	macOS, Linux, Windows
Robotics:	ROS
GPU Programming:	OpenCL, OpenGL, CUDA
CI/CD:	TravisCI, Docker
Other:	git, LaTeX, Geant4, ROOT

AWARDS

R&D 100 Award Winner, R&D World Magazine, WTWH Media	**Nov 2019**
Best Paper Award, UC Berkeley NE Dept.	**Dec 2018**
Runner-up Student Paper Competition, IEEE NSS-MIC	**Oct 2017**
Best Oral Presentation, University Program Review Meeting	**Jun 2017**
Best Poster Award, INMM Annual Meeting	**Jul 2015**
Highest Academic Honor Award, UC Santa Barbara, Physics Dept.	**May 2013**
Highest Honors, UC Santa Barbara	**May 2013**

REFERENCES

Available upon request.