Ian Faust

Education

2009–August 2016 **Doctorate in Nuclear Science and Engineering**, *Massachusetts Institute of Technology*, Cambridge, MA, USA, 4.6/5.0.
Dissertation - Quantification of Lower Hybrid wave absorption in the edge of the Alcator C-Mod tokamak

2005–2009 **B.S.E in Nuclear Engineering and Radiological Sciences**, *University of Michigan*, Ann Arbor, MI, USA, 3.825/4.0.
Summa Cum Laude, minor in Mathematics, Dean's List - 6 of 8 semesters, University Honors - 5 of 8 Semesters, Tau Beta Pi and Alpha Nu Sigma engineering honor societies

2018,2019 **Coursera, Udacity**, Udacity Nanodegree - Computer Vision, Coursera - Machine Learning.

Work Experience

Oct. 2018–Jan. 2019 **Founder, BE2 Cohort**, *Entrepreneur First*, Berlin, DE.
Second Berlin cohort member developing business propositions for deep tech startups, focussed on plenoptic cameras for SLAM applications

2016–Oct. 2018 **Postdoctoral Associate, ASDEX-Upgrade Tokamak**, *Max Planck Institute for Plasma Physics*, Garching bei München, DE.
Worked as an experimental physicist focused on soft X-ray and vacuum ultraviolet spectrometer systems (spectroscopy under vacuum). Machine learning was then used to characterize a new emission line of tungsten. This work also encompassed the repair, maintenance, design, development and analysis of these systems. This work has included the following highlights:

- Reverse engineering of a vacuum-ultraviolet spectrometer system
- Rapid development/prototyping of a calibration system for the spectrometer, returning it to proper operation
- Data engineering and machine learning of large datasets using likelihood-based statistical and regularization-based regression in Python, C and SQL
- Installation and maintenance of related machine learning software (*e.g.* LAPACK, BLAS, Tensorflow, Pandas, Scikit-learn, Numpy) on Solaris and Linux servers
- Development of an IoT device for measurement monitoring using ESP8266-based hardware with software written in C (full description available on my website)

Located – Shanghai, PR China. American, not married, age 32, no children
001 (573) 999 7483 • *icfaust@gmail.com* • *ianfaust.com*
faustian • *icfaust* • *(wechat) - icfaust*

2009–2016 **Graduate Student Researcher, Alcator C-Mod Tokamak**, *MIT Plasma Science and Fusion Center*, Cambridge, MA, USA.

Research focused on the measurement of radiofrequency (LHRF) power and related attributes on a tokamak. This work spanned from design, manufacture data acquisition and analysis for several plasma measurement systems, all of which operated in an extreme thermal, radiation, vacuum, and electromagnetic environment. Thesis work analyzed multiple measurements with modulated RF power to synthesize the time and space-dependent nature of its deposition.

- design and implementation of X-ray and vacuum ultraviolet radiometers
- meta-analysis of large datasets with machine learning and formulation of advanced analysis codes for fusion science in Python, MATLAB, C and IDL
- hands-on RF system work for high-power antenna operation
- rapid prototyping and implementation of several low cost visible and near-infrared camera systems

summer 2008,2009 **Summer Intern**, *Schlumberger - Princeton Technology Center*, Princeton Junction, NJ, USA.

Experimentalist in the neutron and X-ray generator group

- Built a plasma source using a wideband RF generator and vacuum system for use on neutron generators
- Tested X-ray generators and detectors for future innovation for downhole X-ray use
- Tested high voltage breakdown and tracking for oil exploration applications

summer 2007 **SULi Intern**, *Los Alamos National Laboratory*, Los Alamos, NM, USA.

Student researcher on the FRX-L experiment (P-24 group)

- Built Marx banks for the integration of field reversed plasmas with the Shiva Star facility (AFRL)
- Implemented shielded analog integrators for the FRX-L experiment

summer 2006 **Summer Intern**, *University of Missouri Research Reactor*, Columbia, MO, USA.

- Worked on lithium spinel growth for QCP testing on a triple axis neutron spectrometer

Skills

Languages Native English speaker, B2 (Advanced) German

Codes Advanced - Python (Scikit-learn, Pandas, Numpy, OpenCV), MATLAB, LaTeX, IDL Moderate - SQL, C, Pytorch

CAD Solid Edge and CATIAv5

Other Electronics and mechanical design, PCB layout, 3D printing, welding, reverse engineering

Honors, Awards, and Professional Memberships

Memberships American Physical Society, Eagle Scout

Awards Doroghazi Eagle Scout award, NANT fellowship, 2nd year NERS fellowship (University of Michigan), Outstanding Student Service award (MIT, 2012)

Publications and Presentations

Refereed Journals 2 first author papers, 2 first author contributed conference papers, 24 co-author papers, 9 co-author conference proceedings

Conference Presentations 2 first author presentations (one invited talk at 2015 APS-DPP conference in Savannah, GA, USA)

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