

ANDREW A. GANSE

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PROFILE

Data and applied scientist with background in machine learning (classification and regression), tracking and sensor fusion, inverse problems, databases, and analyzing messy data. Strong communication skills; I enjoy guiding junior team members and interns. Prefer a data or applied science role developing solutions for physical sensor data and machine learning problems.

EDUCATION

Ph.D. Geophysics, University of Washington.

B.S. Electrical Engineering, University of Washington.

PROFESSIONAL EXPERIENCE

Radar Data Scientist, R&D Team, Echodyne Corporation. *Dec 2017 – present.*

- Project team member on multiple machine learning (including deep learning / transfer learning) projects in detection and classification on novel radar data for drone, security, and automotive problems. Scikit-learn, Keras, Tensorflow, TitanV's.
- Driving the design and build-out of a machine learning workflow framework for training, feature experimentation, and field evaluation of classification models.
- Analyzing the dynamic behavior of radar control systems and characterizing performance of target detection and tracking using Python/Pandas.
- Designed and led development of the company's field-test database system driving our machine learning and radar performance analyses, using PostgreSQL and Python.
- Led development of internal website portal and interactive labeling system for that database.
- Hiring manager for the successful hire of a data engineer position supporting some of this work.
- Technical management of groups of 2-5 people per project in multiple concurrent projects; mentoring of interns and junior staff; co-organizer of company's intern program; advising coworkers on use of git, python environments, and Linux system administration.

Principal Scientist, Anseres Research & Technology LLC. *Sept 2016 – Dec 2018.*

- Scientific research consulting in defense, geophysical, and space science applications.
- Completed multiple federal R&D subcontracts building on some of my earlier research in statistical inference for remote sensing problems.
- Led SBIR proposal submission on Deep Learning for Clutter Reduction in [Sonar Systems], with university collaborators.
- Internal R&D predicting estuarine salinity from electric fields using TensorFlow neural networks.

Data Scientist, Spare5. *Jan 2016 – June 2016.*

- Designed and developed machine learning algorithms for data quality assessment and user reputation evaluation on Spare5's intelligent crowdsourcing platform.
- Innovated in the use of probabilistic classifiers, expectation maximization, word2vec; using R/Rserve, Python/Pandas, PostgreSQL, Git.
- Engaged in press/analyst briefings, meetings with customers, public speaking (Datapalooza).

Senior Research Physicist, Applied Physics Laboratory, Univ. of WA. Apr 1999 – Nov 2015.

- Solved nonlinear regression, inversion, optimization, tracking, and signal processing problems in acoustic, seismic, electromagnetic, and gravity remote sensing applications; using Python, Matlab, Octave, C, Java, Fortran, Linux shell scripting; administrated Linux clusters.
- Developed Kalman nonlinear smoothing/tracking and parameter estimation algorithms to acoustically track a 5km(!) long vertical hydrophone array for our ocean acoustic experiment.
- Analyzed fluctuations in intensity and pulse spreading of ocean acoustic signals interacting with ocean internal waves, testing prevailing theory with our at-sea experimental measurements.
- Created Markov Chain Monte Carlo based Bayesian inversion of acoustic data on a Linux cluster.
- Organized technology transfer of a new APL-developed technology to a small business.
- Designed research experiments, presented results at conferences, wrote proposals and reports to sponsors, interfaced with sponsors, wrote and reviewed research papers.
- Led system engineering and field testing for an experimental “towed CTD chain” cabled instrument containing 90 sensors, managed teams of 2-6 others at a time in testing and operation of the system. Managed two students in statistical programming projects.

Database Programmer, Pacific States Marine Fisheries Commission. Jan–Dec 1998.

c/o National Oceanic & Atmospheric Administration (NOAA) National Marine Fisheries Service.

- Programmed data processing and extraction routines for an Oracle database of commercial fishing in western U.S. Provided expertise in Oracle, SQL, UNIX to two PSMFC agencies.

ADDITIONAL EXPERIENCE

- **Industry consultant for undergraduate computer vision project.** Jan 2019 – Apr 2019.
DigiPen Institute of Technology; Prof. Jeremy Thomas, co-advisor.
Advised student on senior project in computer vision for traffic flow analysis based on automated photo recordings, using a pre-trained deep learning model.
- **Recurring guest lecturer, graduate-level inverse theory (statistical inference).** 2008 – 2015.
University of Washington, Earth and Space Sciences Department.
Wrote and taught 1.5-hour lectures for numerous graduate-level geophysical inverse theory classes of ~10 students. Developed the seven computational lab assignments still used today.

RECENT PUBLICATIONS AND PRESENTATIONS

- **Ganse, A.A.**, “An eigenspectrum filter-factors approach to interpreting regularization and subspace methods”, presentation at Echodyne Corporation, Dec 2019.
- Roberts, J.H., S. Vance, **A.A. Ganse**, “Detection of Gravity Anomalies on Europa using Line-of-sight Gravity Profiles”, Abstract P42B-06, Fall Meeting AGU, San Francisco (2018).
- Andrew, R.K., **A.A. Ganse**, A.W. White, J.A. Mercer, M.A. Dzieciuch, P.F. Worcester, “Low-frequency Pulse Propagation over 510 km in the Philippine Sea: A Comparison of Observed and Theoretical Pulse Spreading”, *J. Acous. Soc. Am.*, 140, 1 (2016).
- **Ganse A.A.**, S. Vance, and J. Roberts (2014), “Inverse theory resolution analysis in planning radio science gravity investigations of icy moons”, Abstract P43C-3997, Fall Meeting AGU 15-19 Dec, San Francisco (2014).
- **Ganse A.A.**, R.K. Andrew, F.S. Henyey, J.A. Mercer, P.F. Worcester, M.A. Dzieciuch, “Model and data comparisons of ocean acoustic intensity statistics in the Philippine Sea 2010 experiment”, *J. Acoust. Soc. Am.* 135, 2306 (2014).