

Experience

- Data Scientist** *n-Join, New York, NY* 2016 - Present
- Researching methods for associating and performing anomaly detection on industrial data streams
 - Implementing developed algorithms in production codebase (Java)
- R&D Scientist / Software Engineer** *MuseAmi, New York, NY* 2013 - 2016
- Researched polyphonic pitch detection for music, using neural networks
 - Developed pitch tracking algorithm and vocal effects modules for musical mobile apps
 - Front-end iOS app development and integration with third party apps
 - Evaluated a system for optical recognition of musical scores
- Software Engineering Intern** *LongTail Video, New York, NY* Summer 2012
- Developed Apple HLS support for Flash in JWPlayer
- Software Engineering Intern** *Level 7 Concepts, New York, NY* Summer 2011
- Developed iOS app for sound event detection to assist the hearing impaired
- Audio Analysis Intern** *Eastman Kodak Company, Rochester, NY* Summer 2010
- Investigated approaches to automatic video summarization using audio cues
- Teaching Assistant** *Columbia University EE Department, New York, NY* 2006 - 2007
- Intro to Genomics, Intro to EE Lab
- Engineering Intern** *Johns Hopkins University Applied Physics Laboratory, Laurel, MD* Summer 2006
- Developed tools for data extraction and user interface in Matlab; analyzed oceanographic data

Education

- Ph.D. Electrical Engineering** *Columbia University, New York, NY* 2008 - 2013
- Dissertation: *Characterizing Audio Events for Video Soundtrack Analysis*
 - Research interests: statistical machine learning for recognizing/classifying events in unstructured audio, sparse and separable representations, joint audio-visual signal analysis, fingerprinting
 - Areas of study: Advanced Machine Learning, Statistical Methods for Video Indexing and Analysis, Speech and Audio Processing and Recognition, Advanced Video Coding, Visual Interfaces
- M.S. Electrical Engineering** *Columbia University, New York, NY* 2006 - 2008
- B.E. Electrical Engineering** *University of Delaware, Newark, DE* 2002 - 2006

Languages / Skills

Python (scikit-learn, pandas) / Java / C/C++ / Objective-C / Matlab / AWS / Git / Test-driven dev

Selected Publications

- C Cotton, D Ellis. Subband Autocorrelation Features for Video Soundtrack Classification, IEEE ICASSP 2013.
- C Cotton, D Ellis. Spectral vs. Spectro-Temporal Features for Acoustic Event Detection, IEEE WASPAA 2011.
- C Cotton, D Ellis, A Loui. Soundtrack Classification by Transient Events, ICASSP 2011.
- C Cotton, D Ellis. Audio Fingerprinting to Identify Multiple Videos of an Event, ICASSP 2010.
- W Jiang, C Cotton, S-F Chang, D Ellis, A Loui. Short-Term Audio-Visual Atoms for Generic Video Concept Classification, ACM Multimedia 2009.
- C Cotton, D Ellis. Finding Similar Acoustic Events using Matching Pursuit and Locality-Sensitive Hashing, WASPAA 2009.