JESSE ANDERTON

PROFILE

My research is on drawing inferences from subjective opinions and user behavior, with particular focus on ordinal embedding, multi-armed bandits, information retrieval, crowdsourcing, and recommender systems. I also have extensive industry experience in software development.

I created the first successful algorithms for large-scale ordinal embedding: given only the ordering of pairwise distances between objects at unknown positions, these algorithms produce Euclidean vectors which satisfy that ordering, taking a few minutes for millions of points in 30 dimensions. The prior state-of-the-art took days even for 10,000 points and simply failed on large datasets. This has many potential applications on large user behavior datasets, and I am eager to explore the possibilities for improved recommendations, information retrieval, similarity search, and user modeling.

SKILLS

Machine Learning: Ordinal embedding, metric learning, information retrieval, recommender systems, multi-armed bandits, statistical modeling and optimization techniques, computational geometry.

Programming: Java, C, C++, Scala, Go, Perl, Python, Matlab, R, Racket, JavaScript, etc. I pick up the idioms of new programming languages very easily.

Other Software: MapReduce, SQL, NoSQL, LDAP, Angular, Bootstrap, JQuery.

Leadership: As a researcher, I focus on understanding *why* we observe the results we do, rather than simply trying to obtain the *best* results for a particular dataset. A model which makes good predictions for inscrutable reasons is a model you can't debug, explain, or improve on, except through trial and error, and may not be a model you should trust.

I wrote and taught a Master's level course in Information Retrieval, and have written professional training materials for developers and end users. I have been the technical lead for most of my work. I focus on simplicity and efficiency, and seek ways to provide them through software design, process improvements, and human interaction.

EDUCATION

NORTHEASTERN UNIVERSITY, BOSTON — PHD, COMPUTER SCIENCE, MAY 2019
NORTHEASTERN UNIVERSITY, BOSTON — MS, COMPUTER SCIENCE, 2015
UNIVERSITY OF NEW MEXICO, ALBUQUERQUE — BS, COMPUTER SCIENCE, 2005

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PUBLICATIONS

Conferences

Anderton, J. & Aslam, J. (2019). *Scaling Up Ordinal Embedding: A Landmark Approach*. Under review for the 36th International Conference on Machine Learning.

Aziz, M., Anderton, J., Kaufmann, E., & Aslam, J. (2018). *Pure exploration in infinitely-armed bandit models with fixed-confidence*. In Proceedings of the 29th International Conference on Algorithmic Learning Theory.

Metrikov, P., Wu, J., Anderton, J., Pavlu, V., & Aslam, J. A. (2013). *A modification of lambdamart to handle noisy crowdsourced assessments*. In Proceedings of the 2013 Conference on the Theory of Information Retrieval.

Anderton, J., Bashir, M., Pavlu, V., & Aslam, J. A. (2013). *An analysis of crowd workers' mistakes for a specific and complex relevance assessment task*. In Proceedings of the 22nd ACM International Conference on Information & Knowledge Management.

Bashir, M., Anderton, J., Wu, J., Golbus, P. B., Pavlu, V., & Aslam, J. A. (2013). *A document rating system for preference judgements*. In Proceedings of the 36th international ACM SIGIR Conference on Research and Development in Information Retrieval.

Bashir, M., Anderton, J., Wu, J., Ekstrand-Abueg, M., Golbus, P. B., Pavlu, V., & Aslam, J. A. (2013). *Northeastern university runs at the TREC12 crowdsourcing track*.

Preprints

Anderton, J., Metrikov, P., Pavlu, V., & Aslam, J. *Measuring Human-perceived Similarity in Heterogeneous Collections*. ArXiv.

Anderton, J., Pavlu, V., & Aslam, J. *Triple Selection for Ordinal Embedding*.

Anderton, J., Pavlu, V., & Aslam, J. *Revealing the basis: Ordinal embedding through geometry*. ArXiv.

In preparation

Anderton, J., Perrot, M., Garreau, D., & von Luxburg, U. *Fast Geometric Ordinal Embedding*. Preparing for JMLR.

Anderton, J. & Aslam, J. *Density-Sensitive Coverings and Packings*. Preparing for SODA.

Aziz, M., Anderton, J., & Aslam, J. *Adaptively Pruning Features for Boosted Decision Trees.* Preparing for NeurIPS.

Nazari, Z., Anderton, J., & Carterette, B. *Offline evaluation of music recommendations*. Preparing for RecSys.

Anderton, J., Nazari, Z., Cauteruccio, J., Carterette, B., & Diaz, F. *Improved ranking for music recommendations*. Preparing for RecSys.

EXPERIENCE

VISITING RESEARCHER, SPOTIFY; BOSTON – 2018

Implemented production-quality music recommender system for research and possible production use. Publications are forthcoming; details currently confidential.

RESEARCH INTERN, SPOTIFY; NEW YORK CITY – 2017

Conducted offline experiments in music recommendation; showed consistent improvements over baselines across all user demographics. Publications forthcoming.

ENGINEERING INTERN, GOOGLE; NEW YORK CITY, CAMBRIDGE – 2013, 2015

In 2013, I developed text features and evaluation measures for topical clustering of web pages, including techniques for choosing high quality clustering features that handle noise unique to web documents. In 2015, I worked with the Google Play Newsstand team. I applied topical clustering of news articles to develop an improved personalized news article recommendation service, with the potential to improve timely identification of trending topics.

VICE PRESIDENT, BLACKROCK, INC; NEW YORK CITY, BOSTON – 2006-2012

I worked on a variety of projects at Blackrock. The most complex is a system to control and monitor the software servers Blackrock and its clients use to manage their financial assets. My solution consisted of a low level C++ agent to run on each host in our data center, a Java-based message dispatching server to communicate with the C++ agents, and a variety of monitoring and configuration tools. This project focused on disaster resilience, speed of execution, managing the real-time information necessary to manage many thousands of applications, and the command flexibility to make changes in a complex production environment with a minimal impact on end users.

My other work at Blackrock has included training junior and incoming developers, writing wiki-based documentation and training materials, contributing to our library of shared software modules, and helping to define firm-wide programming standards.

PROGRAMMER, ZINGY; NEW YORK CITY – 2006

I worked for six months on a PHP-based media delivery service which sold wallpapers, games, and ringtones for mobile phones. I was primarily responsible for maintaining and updating the system which served promotional content when customers sent text messages to our system.

ANALYST, THE BOEING COMPANY; ALBUQUERQUE – 2001-2005

I was the lead developer for Black Adders, a data analysis package which provided tools for the engineers and scientists working to develop the Airborne Laser missile defense system for the U.S. military. This system imported data into a MSSQL database from the various program modules (Beam Control, Fire Control, messaging, etc.) and allowed users to select particular signals for analysis in a Matlab-based tool. My work revolved around data management. I wrote tools to read the disparate source file formats, and eventually developed logic to handle a wide variety of file formats based on a simple configuration file. I also managed the MSSQL database and wrote ActiveX controls to embed in Matlab GUIs so that data could be exported into the analysis tools. Finally, I wrote a graphical tool in C++ using the .NET framework to allow users to import and manage their data and generate reports from it.

PROGRAMMER, WAVECREST SOFTWARE; TALLAHASSEE, FL – 1997-2000

I developed software for Windows using Java, C, and C++. WaveCrest Software provides tools for programmers and IT professionals. My major projects included a framework which bound Swing components to a JDBC data source, a thin client for a library which allows a Swing-enabled Java program to run on the client/server model, and a virtual machine in C++ which runs software written in the obsolete language CADOL on a modern Windows system.

REFERENCES

Available upon request.