Kyler Eastman, PhD

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Top Skills

- **Languages -** Python, SQL, Scala, Pyspark, MATLAB, Tensorflow
- **Domains** - Recommender Systems, Physiological Metrics
- **ML Dev & Deployment -** AWS (Sagemaker, Lambda, s3, EventBridge), Databricks, REST & gRPC
- **ML Lifecycle & Analysis** - load testing, offline evaluation, simulation, monitoring, A/B testing, multi-arm-bandit testing, causal inference
- **Visualization** - Streamlit, Matplotlib, Tableau
- **Product** - IP development (7 patents), mixed-method research, behavioral analysis, scientific partnerships

Experience

Tonal

Senior Data Scientist **2021-Present**

- working on computer vision and sensor fusion algorithms at scale

Expedia/VRBO/Homeaway

Senior Data Scientist , VRBO/Expedia Group, Austin, TX **2019-2021**

- built production models for property recommendations, increasing engagement by 5%
- developed the offline evaluation framework for property recommendations (see publications)
- end-to-end product management for core data product Recommendation Unified Dataset (RUDS)
- led numerous A/B test designs and developed infrastructure for multi-arm-bandit (MAB) tests.

Senior Advanced Data Analyst, HomeAway, Austin, TX **2017-2019**

- worked within a team of data scientists on A/B test design involving changes to HomeAway's inventory ranking algorithm.
- developed restricted attribution A/B testing framework for evaluating geospatial features
- developed and iterated on filter ranking algorithms, generating $7M in projected value

Under Armour/MapMyFitness

Data Scientist, Under Armour, Austin, TX **2015-2017**

- led cross-functional teams of program managers, software developers, and business analysts to develop insights from fitness and app data from 170 million users.
- built a classifier using DBSCAN and Ramer Douglas Puecker to automatically scan 0.5M daily GPS tracks to identify participants in running races (US patent 10331707)
- applied a random forest classifier to a combined dataset of workout data and app usage to develop a predictive model of engagement and life-time value
- used timeseries anomaly detection methods to catch cheaters within virtual challenges, increasing the value of a core revenue-generating product
- developed consumer segmentation cohorts from a combined dataset of GPS fitness data and consumer surveys using PCA and clustering methods

Performance Data Scientist, MapMyFitness, Austin, TX **2013-2015**

- worked with sport scientists across Under Armour on R&D efforts with both high-end physiological performance data (hundreds) and large datasets (millions) of consumer fitness data.
- built a prototype running route recommendation service by encoding GPS tracks into a graph database (US patent 98336672)
- developed a client-facing recovery dashboard for the University of Notre Dame Men's Soccer Team
- developed energy expenditure algorithms that were implemented on Under Armour's first wearable activity tracker, the UA Band.

Innovation Engineer, MapMyFitness, Austin, TX **2012-2013**

- developed a method for running gait analysis using neuroscience-inspired feature extraction methods on smartphone accelerometer data determining cadence, ground contact time, and left/right asymmetry (US patent 9700241)
- developed the MapMyFitness algorithm for determining elevation gain from GPS timeseries; compared four different methods against a gold-standard dataset of thousands of altimeter readings, reducing error by 50%
- created visualizations for promotional materials shown at a variety of trade shows and conferences, including CES and SXSW

University of Texas at Austin

Research Engineer, Center for Perceptual Systems **2008-2012**

- primary developer of MATLAB electrophysiology toolbox including hardware/software interface, real-time programming, human factors issues, and documentation/tutorials.
- performed electrophysiological experiments, participated in surgical procedures
- developed stochastic models of LIP spike data, pulling apart relative contributions of motor, decision and visual signals

Graduate Student/Research Assistant **2003-2008**

- TA for graduate level statistics courses – non-parametric statistics & simulation
- dissertation: modeled subjects' abilities to integrate probabilistic evidence within a varying but well-defined reward structure
- master's: developed desktop and immersive VR experiments (in Python) to compare vestibular and proprioceptive contributions to wayfinding and route learning in large-scale spaces (mazes)

Education

- Ph.D, University of Texas at Austin, Cognitive Science
- M.S., University of Texas at Austin, Cognitive Science
- Sc.B, Applied Mathematics, Brown University

Patents

- Apparatus and method for using map data in a calibration process
- System and method for determining the occurrence of organized athletic events
- System and method for graph encoding of physical activity data
- Activity tracking device and associated display
- Gait analysis system and method
- Method and apparatus for determining a type of data and an integrity of data
- System and method for providing recommendations based on travel path and activity data

Selected Publications

- Hejazinia, M., Eastman, K., Ye, S., Amirabadi, A., & Divvela, R. (2019). Accelerated learning from recommender systems using multi-armed bandit. *arXiv preprint arXiv:1908.06158*.
- Hirsch, J. A., James, P., Robinson, J. R., Eastman, K. M., Conley, K. D., Evenson, K. R., & Laden, F. (2014). Using MapMyFitness to place physical activity into neighborhood context. *Frontiers in public health*, *2*, 19.
- Eastman, K. M., & Huk, A. C. (2012). PLDAPS: a hardware architecture and software toolbox for neurophysiology requiring complex visual stimuli and online behavioral control. *Frontiers in neuroinformatics*, *6*, 1.
- Eastman, K., Stankiewicz, B., & Huk, A. (2007). Optimal weighting of speed and accuracy in a sequential decision-making task. *Journal of Vision*, *7*(9), 428-428.
- Eastman, K. M., & Simmons, J. A. (2005). A method of flight path and chirp pattern reconstruction for multiple flying bats. *Acoustics Research Letters Online*, *6*(4), 257-262.