

Luke Barrington

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Education

University of California, San Diego

Ph.D. in Electrical & Computer Engineering (Signal & Image Processing), December 2011
“Machines that Understand Music”: Machine learning & crowdsourcing for computer audition.
M.S. in Electrical & Computer Engineering, December 2005

University College Dublin, Ireland

B.E. with First-Class Honors in Electronic Engineering, June 2001

Work Experience

Tomnod, Inc.

San Diego, CA

Developing technologies that combine crowdsourced human intelligence with automated machine learning for rapid, accurate analytics of massive geospatial datasets including images, video, text and social media.

Founder & Chief Technical Officer

September 2010 – Present

Music Search, Inc.

San Diego, CA

Invented machine learning, signal processing and crowdsourcing methods to power an Internet-scale music search engine.

Founder & Chief Technical Officer

June 2007 – June 2010

Fair Isaac Corporation

San Diego, CA

Developed and implemented neurocomputing and statistical machine learning algorithms for speech recognition and natural language understanding.

Neurocomputing Engineer

Jan 2004 – June 2005

Voxpilot Ltd.

Dublin, Ireland

Developed multimodal computer interface systems and Internet voice applications using a range of software and hardware technologies.

Multimodal Human-Computer Interface

Developer

June 2001 – September 2001

Research Experience

Valley of the Khans

San Diego, CA & Mongolia

Built a crowdsourcing platform for human analysis of satellite imagery, in search of the tomb of Genghis Khan. The crowdsourcing website attracted 10,000 users and collected 2 million human inputs, resulting in the discovery of 55 archaeological sites during an expedition to Mongolia.

Crowdsourcing Architect & Field Explorer

January 2010 – December 2010

Advanced Telecomms Research Institute

Takanohara, Japan

Invented a system for ambient communication of information about facial affect using realtime music effects while a fellow at the National Science Foundation's East Asian Pacific Studies Institute.

Research Fellow

June 2005 – September 2005

Fair Isaac Corporation

San Diego, CA

Contributed to the Novel Intelligence from Massive Data (NIMD) project by using statistical analysis of large text corpora to automate language understanding.

Research Intern

June 2003 – September 2003

Technical Skills

Mastery of web application development, including PHP, JavaScript, HTML5, CSS, Flash.
Database architect, emphasis on geospatial data, using MySQL, PostgreSQL, PostGIS & GDAL.
Machine learning expert, including SVM, GMM, Boosting, time-series models and data-mining.

- Selected Publications**
- L. Barrington, D. Turnbull and G. Lanckriet **Game-Powered Machine Learning**. *Proceedings of the National Academy of Sciences* (to appear), 2012.
- L. Barrington, S. Ghosh, M. Greene, S. Har-Noy, J. Berger, S. Gill, A.Y-M. Lin and C. Huyck **Crowdsourcing earthquake damage assessment using remote sensing imagery**. *Annals of Geophysics* 54(6), 2011.
- L. Barrington, N. Ricklin, S. Har-Noy, J. Stastny and K. Rainey **Ship Identification in Cloudy Satellite Imagery: Computer Vision Methods for Cloud Rejection**. *Applied Imagery Pattern Recognition*, 2011.
- L. Barrington, A.B. Chan and G. Lanckriet **Modeling Music as a Dynamic Texture**. *IEEE Transactions on Audio, Speech, and Language Processing*, 18(3), p602-612, 2010.
- L. Barrington, R. Oda and G. Lanckriet. **Smarter Than Genius? Human Evaluation of Music Recommender Systems**. *International Conference Music Information Retrieval*, 2009.
- L. Barrington, T.K. Marks, J. Hsiao and G.W. Cottrell **NIMBLE: A kernel density model of saccade-based visual memory**. *Journal of Vision*, 8(14):17, p1-14, 2008.
- D. Turnbull, L. Barrington, D. Torres, and G. Lanckriet. **Semantic annotation and retrieval of music and sound effects**. *IEEE Transactions on Audio, Speech, and Language Processing*, 16(2), p467-476, 2008.
- Patents**
- D. Turnbull, L. Barrington, R. Liu, and G. Lanckriet. **Generating Audio Annotations for Search and Retrieval**. US patent #20080235283, issued December 2011.
- M.J. Lyons, L. Barrington, D. Diegmann and S. Abe. **Ambient awareness of affective state via musical modifications**. Japanese patent filed March 2006.
- Honors and Awards**
- Geospatial Intelligence symposium Research Achievement Award** awarded for *Crowd-sourced search for the tomb of Genghis Khan using remote-sensing imagery*, October 2011.
- Qualcomm Innovation Fellowship** awarded for *Location-, Preference-, Demographic- and Content-Based Music Search and Recommendation*, Graduate Fellowship, May 2010, \$100,000
- National Science Foundation Integrative Graduate Education and Research Traineeship** on *Vision and Learning in Humans and Machines*, Graduate Fellowship, 2006 to 2008
- von Liebig Center Commercialization Grant** for “Interactive Game-based Music Annotation for Music Retrieval and Recommendation”, May 2007, \$50,000
- National Science Foundation East Asian Pacific Studies Institute (EAPSI)** in Japan, Graduate Fellowship, June 2005 to September 2005
- UCD / Siemens Young Engineer of the Year**, Finalist in Institution of Engineers of Ireland’s national competition. Project: *Environmental control based on Internet technologies*.
- In the Media**
- Going Head To Head With Genius On Playlists** *Slashdot*, November 5, 2009
<http://apple.slashdot.org/story/09/11/05/227236/Going-Head-To-Head-With-Genius-On-Playlists>
- Gadgets Join the Search for the Lost Tomb of Genghis Khan** *Wired*, July 28, 2009
<http://www.wired.com/gadgetlab/2009/07/genghis-khan/4/>
- “Music Genius”** *San Diego Channel 6 News*, May 17, 2009
<http://www.sandiego6.com/mediacenter/local.aspx?videoid=606084>