

Yanxin Pan

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Education

University of Michigan, College of Engineering, Ann Arbor, MI, US *Sep.2015-Present*

- Ph. D. in Design Science and Scientific Computing (GPA: 3.83/4)
- Concentrations: Machine learning + Marketing
- Research Interest: Multimodal design preference modeling using large-scale crowdsourcing datasets
- Advisor: Professor Panos Y. Papalambros and Professor Richard Gonzalez
- Expected graduation: June 2018

University of Michigan, College of Literature, Science and the Arts, Ann Arbor, MI, US *Sep.2013-May 2015*

- M.A. in Applied Statistics

Zhejiang University, Department of Mathematics, Hangzhou, China *Sep.2009-Jun.2013*

- B.S. in Statistics

Professional Experience

Summer Intern, General Motors Company, Warren, MI, US *May. 2017 – Aug. 2017*

- Investigated how people value aesthetics attributes of automobiles and how people make trade-offs between aesthetics attributes and functional attributes.
- Determined the impact of using images to represent aesthetics attributes on the conjoint analysis.

Quantitative Analyst, Long-Qi Scientific Investment, Hangzhou, China *Oct. 2012 – Jun. 2013*

- Developed a high-frequency trading algorithm for Index Futures with annual return rate over 225% and annual Sharpe Ratio over 6.87. Ranked 2nd in Yong-An Nationwide Index Future Competition.
- Presented daily statistical results to teammates and delivered the final presentation of the new trading algorithms to the board of directors.

Summer Intern, Bank of Shanghai, Hangzhou, China *Jun. 2012 – Aug. 2012*

- Participated in credit card checking process.
- Wrote summary report of monthly sales target completion status of 8 sub-branches.
- Offered consulting service of credit card application information for clients through phone-call.

Summer Intern, 3DFAMILY Co. Ltd, Nanjing, China *Jul. 2011- Aug. 2011*

- Applied Statistical Process Control Model to control product quality.

Research Experience

University of Michigan, Ann Arbor, MI, US *May 2014-Present*

Graduate Student Research Assistant

Scalable Deep Learning Approaches to Prediction and Interpreting Product Aesthetic Preferences.

- Proposed deep learning approaches for prediction of aesthetic design attributes for diverse customers across various markets.
- Interpreted the aesthetic perception by visualizing the salient design regions of visual attention that affect aesthetic appeal.
- Used 15 million 2D images and 10,000 crowdsourced human responses to train the model and project customer responses on image space.

Improving Market Preference Prediction Accuracy using Feature Learning

- Developed a novel feature learning method for joint estimation of low-rank +sparse matrix decomposition of over 5,000+ real passenger vehicle purchase data.
- Proved a theoretical estimation error bound on learning the low-rank matrix, subsequently allowing an additional variational bound on the estimated likelihood function.

Quantifying Design Freedom and Brand Recognition

- Defined a distance metric to quantitatively capture both geometric and perceptual differences between designs.
- Developed a partial rank aggregation algorithm based on Markov Chain to obtain the design attribute values from crowdsourced evaluation responses. The uniqueness of the full rank is theoretically guaranteed and it is also applicable with fast speed when a large number of partial ranking data available.

Publications

- **Pan, Y.**, Burnap, A., Hartley, J., Gonzalez, R., and Papalambros, P. Y., "Deep Design: Product Aesthetics Modeling for Heterogeneous Markets", In Proceedings of the KDD'17, Halifax, NS, Canada, August 13-17, 2017.
- **Pan, Y.**, Burnap, A., Liu, Y., Lee, H., Gonzalez, R., and Papalambros, P. Y., "A Quantitative Model For Identifying Regions Of Design Visual Attraction And Application To Automobile Styling", Proceedings of the DESIGN 2016 14th International Design Conference, Dubrovnik, Croatia, May 16-May 19, 2016.
- **Pan, Y.**, Burnap, A., Liu, Y., Ren, Y., Lee, H., Gonzalez, R., and Papalambros, P. Y., "Improving Design Preference Prediction Accuracy using Feature Learning", Journal of Mechanical Design, Vol. 138, No. 7, 2016, 071404.
- Burnap, A., Hartley, J., **Pan, Y.**, Gonzalez, R., and Papalambros, P. Y., "Balancing Design Freedom and Brand Recognition in the Evolution of Automobile Brand Styling", *Design Science Journal*, 2.9 (2016).
- Burnap, A., Liu, Y., **Pan, Y.**, Lee, H., Gonzalez, R., and Papalambros, P. Y., "Estimating and Exploring the Product Form Design Space using Deep Generative Models", Proceedings of the ASME 2016 International Design Engineering Technical Conferences, Charlotte, NC, Aug 21-Aug 24, 2016.
- Burnap, A., Hartley, J., **Pan, Y.**, Gonzalez, R., and Papalambros, P. Y., "Balancing Design Freedom and Brand Recognition in the Evolution of Automotive Brand Styling ", Proceedings of the ASME 2015 International Design Engineering Technical Conferences, Boston, Aug 2-Aug 5, 2015, DETC2015-47908. **(Best Paper Award)**
- Chen, P. Y., Qi, Z., **Pan, Y.**, and Cheng, S. M. (2015, September). Multivariate and Categorical Analysis of Gaming Statistics. In 2015 18th International Conference on Network-Based Information Systems (NBIS), (pp. 286-293). IEEE.

Awards

- **KDD 2017 Student Travel Award**
- **IDETC 2015 Best Paper Award**
- **Design Science Fellowship 2015**

Skills

Python (Tensorflow, Lasagne, Theano, Scikit-learn, Pandas), Matlab, R, LaTeX, SQL, SAS