

TAY SHIN

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EDUCATION

University of California, Berkeley

Graduation: December 2013

B.A. Statistics, Concentration in Mathematics and Computer Science

RESEARCH EXPERIENCE

- | | | |
|---|--|--|
| 02/17 - Current
CAMBRIDGE, MA | Prof. Ed Boyden's Synthetic Neurobiology Group, MIT Media Lab
• Developing novel nanoscale imaging tools, such as expansion microscopy and its accompanying chemical labels for key biomolecules, for brain mapping – connectomics – research
• Using state-of-art deep learning to connect functional brain data to structural brain data
• Created an automatic detection model to identify signs of diabetic retinopathy in eye images
• Created a model for delineating cancer and reconstructed segmented CT images in 3D | <i>Research Affiliate</i> |
| 08/15 - 01/17
SEOUL, KOREA | Personnel Budget Projection Model, Ministry of National Defense
• Used various time-series machine learning techniques to build a forecasting model (monthly temporal resolution) managing the military's personnel budget (around \$15 Billion dollars); implementation of the model has been saving around \$20 million dollars annually for the military
• Built a dynamic programming econometrics model for predicting each military personnel's future stay/leave behavior; convinced the policy makers to adopt the model nationwide | <i>Data Scientist</i> |
| 02/15 - 07/15
SEOUL, KOREA | Estimating the Suicide Risk of Soldiers, Ministry of National Defense
• Created a predictive model for estimating the suicide risk of soldiers based on their physiological data; the model out-performed the original model by 140% AUC-ROC chart basis
• Conducted counselling and surveys across the military to better construct and validate the model | <i>Data Scientist</i> |
| 08/13 - 09/14
BERKELEY, CA | Popular music as an economic indicator
• Scripted in Python and R to collect and rearrange 1,825,000 values in nine unique characteristics of top-ranked, popular songs in the United States (1960-2010)
• Investigated causal relations by conducting Granger and instantaneous causality test, impulse-reponse analysis, and forecast error variance decomposition analysis; Used vector autoregression techniques to capture the linear interdependencies among multiple time series data | <i>Advisors: Prof. James L. Powell, UC Berkeley</i> |
| 04/13 - 04/14
BERKELEY, CA | Bank credit financial economics
• Developed an evolved model for classifying bank failure by considering 68 accounting variables from balance sheets of 98,540 different banks
• Defined decision boundaries by considering different types of errors of the models obtained by several machine learning and econometric models | <i>Advisor: Prof. Raymond J Hawkins, UC Berkeley</i> |

PUBLICATIONS

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|---------------------|--|
| Neuroscience | 1. E. Karagiannis, J. S. Kang, T. Shin, et al., Expansion microscopy for connectomics, in preparation.
2. S. Alon, et al., Expansion microscopy for in-situ sequencing, in preparation. |
| Economics | 3. Tay Shin, et al., Military Personnel Quit Behavior Estimation, in preparation. |

MAJOR AWARDS

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|-------------|--|-----------------------------|
| 2017 | Harvard China Forum Startup Competition | <i>3rd Prize (\$10K)</i> |
| 2016 | Minister of National Defense, South Korea | <i>Ministerial Citation</i> |
| 2015 | Kaggle Data Science Competition: Acquire Valued Shoppers Challenge | <i>top 1%</i> |
| 2015 | Kaggle Data Science Competition: How much did it rain? | <i>top 1%</i> |
| 2015 | Kaggle Data Science Competition: Liberty Mutual Group | <i>top 1%</i> |