

MAY MERKLE-TAN, PHD

DATA SCIENTIST

Trained as a neuroimaging scientist studying brain functions in health and disease, May thrives in the interdisciplinary process of discovery and translating findings into data-stories. She is committed to integrating best practices in machine learning, statistical methods, and human interaction to derive actionable data insights. May grew up in Singapore, is educated in the UK and Germany, and is a US permanent resident (green-card holder).

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COMMUNICATION | IMPACT

LINK TO PUBLICATIONS (10) & TALKS (27): [HTTP://ORCID.ORG/0000-0003-2109-0781](http://ORCID.ORG/0000-0003-2109-0781)

Involved in knowledge sharing (communicating research; giving lectures on neuroimaging methods; scientific peer-reviewing; initiated and ran journal club for researchers), mentoring and outreach (supervising STEM students); participating in public data dives (e.g. DataKind | Smart Cities Hackathon)

EDUCATION

UNIVERSITY OF EDINBURGH, UK
PhD Cognitive Neuroimaging
Research supported by The Carnegie Trust and conducted in collaboration with the Brain Sciences Center, University of Minnesota, Minneapolis VA Medical Center, USA

INTERNATIONAL MAX PLANCK RESEARCH SCHOOL, UNIVERSITY OF TÜBINGEN, GERMANY
MSc Neural & Behavioural Sciences

Thesis: Investigated somatosensory discrimination processes using evoked magnetic field analysis and equivalent dipole source estimation of neural signals

UNIVERSITY OF EDINBURGH, UK
MA (Hons) Psychology
Honors Concentration: Cognitive Neuroscience, Neuropsychology | Additional Courses: Engineering Mathematics, Linguistics

SKILLS

PROGRAMMING
STATISTICAL
MACHINE LEARNING

WEB SERVICES | DATABASE
EXPERIENCE
WEB-BASED EXPERIENCE
GRAPHICS & VISUALIZATION
RESEARCH

Python, R, Matlab
Parametric & Non-Parametric Statistics, Test-Retest Reliability Assessment, SPSS Regression, Time-Frequency, Time-Series, Classification & Clustering Approaches, Natural Language Processing, Neural Networks
AWS, SQL

Git & Github, HTML, CSS, JavaScript, Flask, BeautifulSoup
Adobe Illustrator, GIMP, ggplot2, seaborn, D3.js
Experimental Design, User-Interface, Data Acquisition, Study Management, Publication & Communication, Scientific Peer Reviewing

EXPERIENCE

Data Scientist
METIS, NYC, USA

Oct 2016 - Current

Integrating research, machine-learning, and statistical tools to derive data-driven insights in full-stack data science projects such as:

- Developed and trained convolutional neural networks (CNN) using Keras with TensorFlow to detect buildings in a highly unbalanced set of proprietary satellite images and generated interactive visualizations of the holdout image classification outcomes (~93% accuracy) using geospatial information embedded in the geotiffs; Further explored image segmentation using computer vision techniques to delineate buildings in images
- Integrated weather and air quality data to predict (83% accuracy) the frequency of asthma patients' visit to the emergency department using gradient boosted trees regression; rendered a prototype D3.js calendar application
- Applied Natural Language Processing (NLP) and word2vec modeling to associate recipe ingredients and to provide additional recipe suggestions based on distance metrics to ingredient tokens in searched recipes; Further developed a "Recipe-Difficulty-Tagger" using structured learning and topic modeling (e.g. LDA | NMF) to engineer features for classifying recipe preparation difficulty (~86% precision & recall) and created a web-app to offer recipe alternatives based on clustering (K-nearest-neighbour) by ingredient topic similarity and categorized by difficulty

Visiting & External Research Affiliate

CENTRE FOR COGNITIVE NEUROIMAGING, UNIVERSITY OF GLASGOW, UK

Oct 2015 - Mar 2017

- Continued collaboration on cross-frequency analysis of brain signals to uncover how dynamic sensory information could be neurally propagated to drive action intention

Senior Research Associate

CENTRE FOR COGNITIVE NEUROIMAGING, UNIVERSITY OF GLASGOW, UK

Sep 2009 - Sep 2015

- Led the examining of test-retest reliability and differential neural oscillatory signals in health and neurological/psychiatric disease; assessed the suitability of neural oscillatory parameters for potential biomarkers in early detection, prognosis, and/or remediation
- Demonstrated high repeatability of signals derived from sensors and approximated source estimations facilitating practical and analytical recommendations for large scale applications
- Related neurophysiological brain signals and neural communication with behaviour. Research insights are beneficial to a) understanding the neural underpinnings in processing or predicting the behavioural intentions of others, b) appreciating developmental and socio-psychiatric disorders, and c) informing clinical rehabilitation of motor function e.g. post stroke
- Involved in projects funded by the Economic and Social Research and the Medical Research Councils, UK

Research Fellow

INSTITUTE OF BEHAVIOURAL NEUROSCIENCE, UNIVERSITY COLLEGE LONDON, UK

Feb 2012 - Aug 2012

- Developed a virtual reality navigation paradigm (using object-oriented Python and Graph-theoretic dynamic programming) for studying (both behaviourally and neurally) how navigators acquire their understanding of an environment and respond to unanticipated changes

Doctoral Candidate & Research Scientist

BRAIN SCIENCES CENTER, UNIVERSITY OF MINNESOTA, USA

Aug 2005 - Sep 2009

- Investigated synchronous neural activity in healthy controls and veterans with Post-traumatic Stress Disorder using magnetoencephalography (MEG) for potential diagnostic and therapeutic applications; Contributed to the development of open-loop classification of patient vs. healthy controls -- mimicking the scenario where you do not necessarily have a 'fixed' training and test dataset for diagnosis; yielded high sensitivity & specificity (~90%)
- Investigated neural correlates of speed and timing during simple movement coordination