Tinashe Michael **Tapera**

PhD Student in Personal Health Informatics

Northeastern University, Boston, MA

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I'm a PhD Student at Northeastern University, co-mentored by Varun Mishra and Stephen Intille. I study how to detect and intervene on mental health states using personal devices like mobile phones and smart watches.

Education

Northeastern University — *Boston, MA*

PhD Personal Health Informatics — *Sep 2022 — May 2027*

- Advisors: Varun Mishra, Stephen Intille

Drexel University — *Philadelphia, PA*

Accelerated MSc. Psychology (Data Analysis Track) — *Sep 2017 — Jun 2018*

- Thesis: Advanced Data Mining Methods for Psychological & Behavioral Research
- GPA: 3.70 (cum laude)

Drexel University — *Philadelphia, PA*

BSc. Psychology — *Sep 2013 — Jun 2017*

- GPA: 3.52
- A.J. Drexel Scholarship
- Dean's List

Professional Experience

UbiWell Lab, mHealth Lab, Northeastern University — *Boston, MA*

Graduate Student — *Sep 2022 — Present*

- Interdisciplinary research at the intersection of mobile/wearable sensing, data science, human-centered computing, and behavioral science.

Penn Lifespan Informatics & Neuroimaging Center — *Philadelphia, PA*

Senior Neuroimaging Data Analyst — *Oct 2018 — Aug 2022*

- Developed data pipelines for ETL and analysis of large-scale neuroimaging data sets between data warehouses in Python, R, and Bash
- Preprocessed and analysed neuroimaging data using cutting-edge software (fMRIPrep, XCPEngine, QSIPrep, ASLPrep)
- Maintained and supported multiple data curation software packages in Python and R

Salesforce — *San Francisco, CA*

Data Science Intern — *May 2017 — Oct 2017*

- Focused on discovery of organizational insight using internal human resources data sets
- Developed a semi-supervised learning algorithm to track employee performance by matching topic models of continuous feedback and goal-setting data
- Investigated comorbidity of employees' insurance claims data to dynamically classify claim types and employee phenotypes

Arzoo LLC — *Philadelphia, PA*

Private Equity Intern — *Oct 2015 — Apr 2016*

- Developed data munging pipelines in Excel for scraping business profile data

Research Experience

UbiWell Lab (Varun Mishra, PhD) — *Northeastern University*

"StressFree: Assessing the Scalability & Feasibility of Digitally Phenotyping Stress" — *2022*

- Aim: Developing tools and software to identify moments of heightened stress in Northeastern undergraduate students, with the long term goal of delivering just-in-time interventions to relieve stress with mobile-CBT approaches

Quantitative Psychology & Statistics Lab (Fengqing Zhang, PhD) — *Drexel University*

"Momentary Changes in Heart Rate Variability Can Detect Risk for Emotional Eating Episodes." — *2015 — 2019*

- Aim: predicting emotional eating episodes in disorded eating patients using a combination of heart rate variability data and self-report
- Outcome: Paper published in Appetite (2019)

Quantitative Psychology & Statistics Lab (Fengqing Zhang, PhD) *Drexel University*

"Application of Advanced Data Mining Models to Identify Dietary Patterns Associated with Risk of Cardiovascular Disease." *2015 — 2019*

- Aim: compare the performance of unsupervised feature selection (PCA/FA) against regularization (L1/L2) in predicting cardiovascular disease biomarkers from high-dimensional food and behaviour survey responses
- Outcome: Master's thesis topic (2018)

Quantitative Psychology & Statistics Lab (Fengqing Zhang, PhD) *Drexel University*

"Improved Modelling of Smartphone-based Ecological Momentary Assessment Data for Dietary Lapse Prediction." *2015 — 2019*

- Aim: predicting dietary adherance lapses in participants using self-reported EMA
- Outcome: Neighbourhood-Based Balancing — A Novel Semi-Supervised Classification Algorithm for Imbalanced Data ("5-Minute Thesis", themed talk at the Well Center Symposium 2018)

Quantitative Psychology & Statistics Lab (Fengqing Zhang, PhD) *Drexel University*

"Identifying Autism Diagnostic Interview: Revised Algorithm Items that Significantly Distinguish Autism Spectrum Disorder and Down Syndrome." *2015 — 2019*

- Aim: Identify phenotypic differences between children with autism spectrum disorder, down syndrome, and comorbid diagnoses using the Autism Diagnostic Interview-Revised (ADI-R)
- Outcome: Paper published in Research in Developmental Disabilities (2019)

Quantitative Psychology & Statistics Lab (Fengqing Zhang, PhD) *Drexel University*

"Modeling Zero-Inflated MVPA Bouts Using a Hierarchical Linear Modeling Framework" *2015 — 2019*

- Aim: predict participants' moderate-to-vigorous physical activity (MVPA) bouts at timepoint 3 from previous timepoints using a zero-inflated Tweedie Poisson regression model in a growth curve modeling context
- Outcome: Final paper submitted in CFTP758 — Dyadic Analysis and Longitudinal Causal Modeling

Statistical and Applied Mathematical Sciences Institute (SAMSI) *NC State University*

"Predicting multiple sclerosis (MS)" *2016*

- Aim: classify participant diagnosis (MS patient vs. control) using lesion count along the corpus callosum in a diffusion dataset
- Outcome: Successfully predicted MS diagnosis using 3 different logistic regression segmentation approaches with 81% classification accuracy

Laboratory for Innovations in Health-Related Behavior Change (Evan Forman, PhD) *Drexel University*

"A Companion Smartphone App to Enhance Dietary Adherence through Predictive Machine Learning" *2015*

- Aim: Data collection, cleaning, and summarization with Excel and SPSS

Publications

First-author

Flywheeltools: data curation and manipulation on the flywheel platform *Frontiers in neuroinformatics*

TM Tapera, M Cieslak, M Bertolero, A Adebimpe, GK Aguirre, ER Butler, ... *2021*

DOES ECOLOGICAL MOMENTARY ASSESSMENT DATA REFLECT BASELINE SELF-REPORT IN WEIGHT LOSS TREATMENT? *ANNALS OF BEHAVIORAL MEDICINE*

TM Tapera, S Goldstein, BC Evans, E Forman *2016*

Middle-author

Diffusion MRI head motion correction methods are highly accurate but impacted by denoising and sampling scheme *Human Brain Mapping*

M Cieslak, PA Cook, G Shafiei, TM Tapera, H Radhakrishnan, M Elliott, ... *2024*

Development of top-down cortical propagations in youth *Neuron*

A Pines, AS Keller, B Larsen, M Bertolero, A Ashourvan, DS Bassett, ... *2023*

Functional Connectivity Development along the Sensorimotor-Association Axis Enhances the Cortical Hierarchy *BioRxiv*

A Luo, VJ Sydnor, A Pines, B Larsen, AF Alexander-Bloch, M Cieslak, ... *2023*

Development of white matter fiber covariance networks supports executive function in youth *Cell reports*

J Bagautdinova, J Bourque, VJ Sydnor, M Cieslak, AF Alexander-Bloch, ... *2023*

ModelArray: An R package for statistical analysis of fixel-wise data *Neuroimage*

C Zhao, TM Tapera, J Bagautdinova, J Bourque, S Covitz, RE Gur, ... *2023*

Developmental coupling of cerebral blood flow and fMRI fluctuations in youth *Cell reports*
EB Baller, AM Valcarcel, A Adebimpe, A Alexander-Bloch, Z Cui, RC Gur, ... *2022*

ASLPrep: a platform for processing of arterial spin labeled MRI and quantification of regional brain perfusion *Nature methods*
A Adebimpe, M Bertolero, S Dolui, M Cieslak, K Murtha, EB Baller, ... *2022*

Curation of BIDS (CuBIDS): A workflow and software package for streamlining reproducible curation of large BIDS datasets *NeuroImage*
S Covitz, TM Tapera, A Adebimpe, AF Alexander-Bloch, MA Bertolero, ... *2022*

Spatially-enhanced clusterwise inference for testing and localizing intermodal correspondence *NeuroImage*
SM Weinstein, SN Vandekar, EB Baller, D Tu, A Adebimpe, TM Tapera, ... *2022*

Mobile footprinting: linking individual distinctiveness in mobility patterns to mood, sleep, and brain functional connectivity *Neuropsychopharmacology*
CH Xia, I Barnett, TM Tapera, A Adebimpe, JT Baker, DS Bassett, ... *2022*

QSIPrep: an integrative platform for preprocessing and reconstructing diffusion MRI data *Nature methods*
M Cieslak, PA Cook, X He, FC Yeh, T Dhollander, A Adebimpe, ... *2021*

A simple permutation-based test of intermodal correspondence *Human brain mapping*
SM Weinstein, SN Vandekar, A Adebimpe, TM Tapera, ... *2021*

Developmental coupling of cerebral blood flow and fMRI fluctuations in youth *BioRxiv*
EB Baller, AM Valcarcel, A Adebimpe, A Alexander-Bloch, Z Cui, RC Gur, ... *2021*

ASLPrep: a generalizable platform for processing of arterial spin labeled MRI and quantification of regional brain perfusion *BioRxiv*
A Adebimpe, M Bertolero, S Dolui, M Cieslak, K Murtha, EB Baller, ... *2021*

Mobile footprinting: linking individual distinctiveness in mobility patterns to mood, sleep, and brain functional connectivity *BioRxiv*
CH Xia, I Barnett, TM Tapera, Z Cui, TM Moore, A Adebimpe, ... *2021*

Mapping Physiology-Function Coupling in Youth *Biological Psychiatry*
E Baller, A Adebimpe, A Valcarel, A Alexander-Bloch, Z Cui, J Detre, ... *2021*

Momentary changes in heart rate variability can detect risk for emotional eating episodes *Appetite*
AS Juarascio, RJ Crochiere, TM Tapera, M Palermo, F Zhang *2020*

QSIPrep: An integrative platform for preprocessing and reconstructing diffusion MRI *Biorxiv*
M Cieslak, PA Cook, X He, FC Yeh, T Dhollander, A Adebimpe, ... *2020*

Autism spectrum disorder (ASD) symptom profiles of children with comorbid Down syndrome (DS) and ASD: A comparison with children with DS-only and ASD-only *Research in Developmental Disabilities*
M Godfrey, S Hepburn, DJ Fidler, T Tapera, F Zhang, CR Rosenberg, ... *2019*

Application of a new dietary pattern analysis method in nutritional epidemiology *BMC medical research methodology*
F Zhang, TM Tapera, J Gou *2018*

A PRELIMINARY INVESTIGATION OF A PERSONALIZED RISK ALERT SYSTEM FOR WEIGHT CONTROL LAPSES *ANNALS OF BEHAVIORAL MEDICINE*
E Forman, S Goldstein, B Evans, S Manasse, A Juarascio, M Butryn, ... *2016*

IS PROMPTING PROBLEMATIC?: CONSIDERATIONS FOR LONG-TERM ECOLOGICAL MOMENTARY ASSESSMENT *ANNALS OF BEHAVIORAL MEDICINE*
SP Goldstein, BC Evans, TM Tapera, E Forman, S Manasse, A Juarascio, ... *2016*

Software & Project Contributions

FlywheelTools *10.5281/zenodo.4752798*
A suite of software tools for curating your neuroimaging data into BIDS on Flywheel *2021*
- R, Python, MongoDB, RMarkdown Reports, Docker

PC Dashboard *10.5281/zenodo.5721127*

An interactive analytics dashboard for the Drexel University Peer Counseling Helpline *2017*

- R, Shiny, Qualtrics API

Teaching Experience

Teaching Assistant

2018	MSc. Psychology — Statistics I & II	*Drexel University*

Service

2022 to present	Member, Mentor	*R 4 Data Science Community (R4DS.io)*
2013 to 2021	Member, Alumni Mentor	*Drexel University Gospel Choir*
2013 to 2018	Peer Counselor, VP of Scheduling & Communications	*Drexel University Peer Counseling Helpline*

Skills

Analytical

Data Science, Statistical Modelling, Reproducible Research, Parameterized & Interactive Reports, Plotting & Visualisation, Object-Oriented Programming

Programming languages

R, Python, Bash

Packages

Tidyverse, RMarkdown/Quarto, ggplot2, Tidymodels, Github Pages, nilearn

Tools

Git, Docker, Singularity, RStudio, VSCode, Jupyter Notebooks, CircleCI