

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 crises from personal devices like mobile phones and smart watches.

Education

Northeastern University

PHD PERSONAL HEALTH INFORMATICS

- Advisors: Varun Mishra, Stephen Intille

Boston, MA

Sep 2022 — Present

Drexel University

ACCELERATED MSc. PSYCHOLOGY (DATA ANALYSIS TRACK)

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

Philadelphia, PA

Sep 2017 — Jun 2018

Drexel University

BSc. PSYCHOLOGY

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

Philadelphia, PA

Sep 2013 — Jun 2017

Professional Experience

UbiWell Lab

GRADUATE RESEARCHER

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

Boston, MA

Sep 2022 — Present

Penn Lifespan Informatics & Neuroimaging Center

SENIOR NEUROIMAGING DATA ANALYST

- 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

Philadelphia, PA

Oct 2018 — Aug 2022

Salesforce

DATA SCIENCE INTERN

- 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

San Francisco, CA

May 2017 — Oct 2017

Arzoo LLC

PRIVATE EQUITY INTERN

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

Philadelphia, PA

Oct 2015 — Apr 2016

Research Experience

UbiWell Lab (Varun Mishra, PhD)

"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

Northeastern University

Quantitative Psychology & Statistics Lab (Fengqing Zhang, PhD)

"MOMENTARY CHANGES IN HEART RATE VARIABILITY CAN DETECT RISK FOR EMOTIONAL EATING EPISODES."

2015 — 2019

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

Drexel University

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 adherence 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

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

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

Development of top-down cortical propagations in youth

BioRxiv

AR PINES, AS KELLER, B LARSEN, M BERTOLERO, A ASHOURVAN, DS BASSETT, ...

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

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

Diffusion MRI Head Motion Correction Methods are Highly Accurate but Impacted by Denoising and Sampling Scheme	BioRxiv
M CIESLAK, PA COOK, TM TAPERA, H RADHAKRISHNAN, MA ELLIOTT, DR ROALF, ...	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
ModelArray: a memory-efficient R package for statistical analysis of fixel data	BioRxiv
C ZHAO, TM TAPERA, J BAGAUTDINOVA, J BOURQUE, S COVITZ, RE GUR, ...	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
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
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
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
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

<i>Teaching Assistant</i>	
2018 MSc. Psychology — Statistics I & II	Drexel University

Service

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

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