

# Tinashe Michael Tapera

SENIOR NEUROIMAGING DATA ANALYST

Philadelphia, Pennsylvania

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*I'm an aspiring graduate student seeking PhD opportunities at the intersection of passive sensing, mental health, and data science.*

## Education

### 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

### Penn Lifespan Informatics & Neuroimaging Center

Philadelphia, PA

SENIOR NEUROIMAGING DATA ANALYST

Oct 2018 — Present

- Develop data pipelines for ETL (extract-transform-load) of large-scale imaging data sets between data warehouses in Python, R, and Bash
- Preprocess and analyse neuroimaging data using cutting-edge software (fMRIPrep, XCPEngine, QSIprep, ASLPrep)
- Actively maintain and support 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

### 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 disordered 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

2015 — 2019

CARDIOVASCULAR DISEASE."

- 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

2015 — 2019

PREDICTION."

- 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

TAPERA, T. M., CIESLAK, M., BERTOLERO, M., ADEBIMPE, A., ..., SATTERTHWAITE, T. D.

2021

- <https://doi.org/10.3389/fninf.2021.678403>

### Middle-author

## A simple permutation-based test of intermodal correspondence

Human Brain Mapping

WEINSTEIN, S. M., VANDEKAR, S. N., ADEBIMPE, A., TAPERA, T. M., ..., SHINOHARA, R. T.

2021

- <https://doi.org/10.1002/hbm.25577>

## Mobile Footprinting: Linking Individual Distinctiveness in Mobility Patterns to Mood, Sleep, and Brain Functional Connectivity

Under Review

XIA, C. HUCHUAN, BARNETT, I., TAPERA, T., CUI, Z., ..., SATTERTHWAITE, T. D.

2021

- <https://doi.org/10.1101/2021.05.17.444568>

## QSIPrep: an integrative platform for preprocessing and reconstructing diffusion MRI data

Nature Methods

CIESLAK, M., COOK, P. A., HE, X., YEH, F., DHOLLANDER, T., ADEBIMPE, A., AGUIRRE, G. K., BASSETT, D. S., BETZEL, R. F., BOURQUE, J., CABRAL, L. M., DAVATZIKOS, C., DETRE, J. A., EARL, E., ELLIOTT, M. A., FADNAVIS, S., FAIR, D. A., FORAN, W., FOTIADIS, P., GARYFALLIDIS, E., GIESBRECHT, B., GUR, R. C., GUR, R. E., KELZ, M. B., KESHAVAN, A., LARSEN, B. S., LUNA, B., MACKEY, A. P., MILHAM, M. P., OATHES, D. J., PERRONE, A., PINES, A. R., ROALF, D. R., RICHIE-HALFORD, A., ROKEM, A., SYDNOR, V. J., TAPERA, T. M., ..., SATTERTHWAITE, T. D.

2021

- <https://doi.org/10.1038/s41592-021-01185-5>

## Developmental coupling of cerebral blood flow and fMRI fluctuations in youth

Under Review

BALLER, E. B., VALCARCEL, A. M., ADEBIMPE, A., ALEXANDER-BLOCH, A., CUI, Z., GUR, R. C., GUR, R. E., LARSEN, B. L., LINN, K. A., O'DONNELL, C. M., PINES, A. R., RAZNAHAN, A., ROALF, D. R., SYDNOR, V. J., TAPERA, T. M., ..., SATTERTHWAITE, T. D.

2021

- <https://doi.org/10.1101/2021.07.28.454179>

## Mapping Physiology-Function Coupling in Youth

Biological Psychiatry

BALLER, E., ADEBIMPE, A., VALCAREL, A., ALEXANDER-BLOCH, A., CUI, Z., DETRE, J., GUR, R., GUR, R., LARSEN, B., LINN, K., O'DONNELL, C., RAZNAHAN, A., ROALF, D., TAPERA, T., ..., SATTERTHWAITE, T.

2021

- <https://doi.org/10.1016/j.biopsych.2021.02.445>

## ASLPrep: A Generalizable Platform for Processing of Arterial Spin Labeled MRI and Quantification of Regional Brain Perfusion

Under Review

ADEBIMPE, A., BERTOLERO, M., DOLUI, S., CIESLAK, M., MURTHA, K., BALLER, E. B., BOEVE, B., BOXER, A., BUTLER, E. R., COOK, P., COLCOMBE, S., COVITZ, S., DAVATZIKOS, C., DAVILA, D. G., ELLIOTT, M. A., FLOUNDERS, M. W., FRANCO, A. R., GUR, R. E., GUR, R. C., JABER, B., McMILLIAN, C., MILHAM, M., MUTSAERTS, H. J.M.M., OATHE, D. J., OLM, C. A., PHILLIPS, J. S., TACKETT, W., ROALF, D. R., ROSEN, H., TAPERA, T. M., ..., AND, T. D. SATTERTHWAITE  
• <https://doi.org/10.1101/2021.05.20.444998>

2021

## Momentary changes in heart rate variability can detect risk for emotional eating episodes

*Appetite*

JUARASCIO, A. S., CROCHIERE, R. J., TAPERA, T. M., PALERMO, M., ZHANG, F.  
• <https://doi.org/10.1016/j.appet.2020.104698>

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*

GODFREY, M., HEPBURN, S., FIDLER, D. J., TAPERA, T., ..., LEE, N. RAITANO  
• <https://doi.org/10.1016/j.ridd.2019.03.003>

2019

## Application of a new dietary pattern analysis method in nutritional epidemiology

*BMC Medical Research Methodology*

ZHANG, F., TAPERA, T. M., GOU, J.

2018

• <https://doi.org/10.1186/s12874-018-0585-8>

## 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

2013 to Present 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, GGPLOT2, GITHUB PAGES, NILEARN

### Tools

GIT, DOCKER, SINGULARITY, RSTUDIO, VSCODE, JUPYTER NOTEBOOKS, CIRCLECI