Adú Matory
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I am a data scientist with 7+ years of research and software development experience on brain & mental health projects. I specialize in neurocognitive biomarker discovery, data strategy, and advanced statistical modeling. I excel at project management, experimental study design, and leveraging cutting-edge technologies to drive development in healthcare

NOTABLE PROJECTS

Digital Therapeutics Platform for Psychotherapy, at Cybin Inc. (2021 - 2022)

Patients often struggle to transform motivation found during therapy sessions into behavioral change in their everyday lives. I **invented a proprietary ML signal processing algorithm** that uses data from **multiple devices to facilitate treatment and evaluate patient outcomes**. I led the project through proof-of-concept, coordinating an international team in Europe, North America and Southeast Asia, and **co-authored a patent** for its use in psychotherapy, adding a 13th patent to the IP of a growing NYSE-traded startup.

Finding Neural Correlates of Personality, at Charité Medical University (2019 - 2020)

Associated with mental disorder severity, personality type is rarely leveraged in psychiatric treatments. A better understanding of its neural basis might be used to improve and personalize clinical care. I **built an open-source application that automates training and comparison of ML and deep learning models** that predict personality type from a **17TB fMRI dataset**. Researchers with little mathematical knowledge can easily find optimal training parameters, explore neural correlates, cluster personality subtypes, and visualize results, furthering their search for reliable neural predictors of psychiatric disease.

WORK EXPERIENCE

Data Scientist, Wearable Tech and Neural Data
Jul 2021 – Jun 2022

Cybin Inc.

- First in-house Data Scientist and **lead engineer of a biosignal analysis pipeline for a digital health platform**. Vetted proposed partnerships with 17 tech companies, **led a team of 15+ engineers and developers** to create an AWS-hosted, **GDPR-compliant app**, and designed a clinical study to evaluate usability of the user interface and gameified features.
- Interviewed internal teams (Clinical, Operations, R&D, Innovation) about their data use cases and **architected solutions for a company-wide data ecosystem** and data governance policies that optimized data integrity and stakeholder accessibility to key insights in a biotech development environment.

Research Assistant, Connectomics for Psychiatry
Sep 2019 – Dec 2020

Research Division of Mind and Brain, Charité Medical University of Berlin

- Sole engineer of an application designed to **investigate brain-biomarkers of clinically relevant psychometrics**, like intelligence and personality. Implemented differential geometry and graph theoretical analyses to extract features from multimodal (e.g. demographic, fMRI) data. Using PyTorch and xarray, **created a novel method of prediction using data fusion** to train **Convolutional Neural Networks** and Gaussian mixture models.
- Sharing data and results **with other psychiatry working groups, identified new directions for research** and organized a conference featuring presenters from University of Oxford.

Research Intern, Altered States of Consciousness
May 2020 – Sep 2020

Neurocomputation and Neuroimaging Unit, Freie University of Berlin

- **Conducted a pilot experiment** to investigate the effect of personal electroencephalographic (EEG) signatures and stimulation frequency on hallucinations. Collected subjects' data, created a database using xarray, and used NumPy and MNE to **identify functional neural activity associated with visual hallucinations** and potential targets for intervention in schizophrenia and psychedelic therapies.
- Discovered preliminary evidence that reduced connectivity between select brain regions may lead to simple visual hallucinations and applied for a grant to further research their underlying neural mechanisms. **Awarded the 2020 *Source Award***, the top-tier research grant from the Source Research Foundation.

Research Intern, Perceptual Bias in Data Visualization
Aug 2019 – Nov 2019

Active Perception and Cognition Lab, Humboldt University of Berlin

- Ran a study using a **new approach to empirically identify best practices in visual design** and determine the the efficacy of traditional heuristics in visual scientific communication**. Modeled behavioral data** with regression and Bayesian hierarchical models in R's RStan and lme, identifying visualization methods that optimize intuitive understanding of the underlying data.
- Implemented an approach to **benchmark various algorithms**, using R's maxLik package, leading to a **5x performance boost** in computational usage and processing time, **enabling my team to save several hours each week and increasing** the speed that they could innovate through model experimentation.

Clinical Research Coordinator, BCI and Experimental Neurotherapies
Jun 2017 – Sep 2018

Neurological Intensive Care Unit, Columbia University Medical Center

- **Coordinator of 14 research studies** on experimental therapies and outcome prediction for neurological disorders, including feasibility studies for the use of brain-computer interfaces for patient pain management. **Project-managed a team of 50 physicians, technicians, and nurses** in the collection of lab, neuroimaging, and EMR data

Co-Founder & Chief Operating Officer, Behavioral Coaching Mar 2017 – Now

The Helpers

- Founded a microbusiness with a mission to **support clients in their mental and cognitive health goals through regular 1:1 check-ins** from our coaches via texts, calls, and in-person meetings. **Grew team from 2 to 9 coaches** who serve 25+ monthly recurring clients.
- Developed business processes for management, marketing, billing, payroll, client onboarding, and training to achieve an **average month-over-month (MoM) customer growth of 13%, MoM revenue growth of 7%, and quarterly customer retention rate of 81%**. Developed a process to grow the business through the team, effectively **reducing my time commitment as a COO down to a few hours/week**.

SOFTWARE

Languages

Python	*Machine Learning* (PyTorch, Tensorflow, Keras, Scikit-Learn, lightgbm), *Data Manipulation* (NumPy, Pandas, xarray), *Visualization* (matplotlib, WandB), *Mathematical Optimization* (bayesian-optimization, PuLP), *Modeling* (MNE, NetworkX, NLTK)	R	*Data Manipulation* (dplyr), *Visualization* (ggplot2), *Modeling* (lme4, Rstan, maxLik)
		MATLAB	*Neuroimaging Analysis* (FieldTrip, Chronux)
		LaTeX	*Typesetting* (amsmath, apacite, mathtools)
		JavaScript	Bootstrap
		HTML	-
Bash	-	CSS	-

Version Control Git, Travis CI **Development Frameworks** Scrum, Kanban **Architectural Patterns** ETL, MVC, E-R

Databases *for Business* (AWS, SQLite, Microsoft Office), *for Research* (REDCap), *EMRs* (Natus, Eclipsys)

PATENTS

Greene, B.; Matory, A. (2023). **Integrated data collection devices for use in various therapeutic and wellness applications** (WO/2023/281071)**.** World Intellectual Property Office.

PUBLICATIONS & PRESENTATIONS

6 peer-reviewed publications/conference presentations. See my [Google Scholar profile] for further details.

EDUCATION & AFFILIATIONS

Computational Neuroscience MSc
Technische Universität – *Berlin, Germany*

I applied machine learning, Bayesian methods, and biophysical models to many collaborative software development projects **modeling neural, cognitive, and behavioral processes**. I **published my master's thesis**, an analysis of failing organ systems during cardiac death, raising ethical considerations about neurovascular coupling.

Psychology BA
New York University **–** *New York, NY, USA*

During a **one-year internship with NYU Langone's psilocybin-assisted psychotherapy research group**, I screened patients for study eligibility and managed study data integrity. For my thesis, I designed a study proposal to investigate the relationship between feelings of unity and craving in patients with alcohol use disorder.

Society for Biological Psychiatry, Associate Member **Black in Neuro**, Member

AWARDS

40 under 40 Outstanding BIPOC leaders in Drug Policy (2022), *Students for Sensible Drug Policy*

Grant for the start or completion of studies (2021), s*tudierendenWERK Berlin*

Source Award (2020), Source Research Foundation
The top-tier research grant, to further study the neural mechanisms of visual hallucinations

Clinical Research Coordinator of Excellence (2018), *Columbia University Medical Center*

Excellence in Programming Award (2016), *New York University Global Spiritual Life*
For outstanding event coordination during NYU's Refugee Awareness Week

LANGUAGES

English (Native), German (Business-fluent), Spanish (Business-fluent)