Adú Matory
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I am a data scientist with 8+ 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 – Oct 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**

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|---|---|---|---|
| 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. View my published works on [Google Scholar] and [Medium].

## 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.

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**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)