Adú Matory

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I am a neuroscientist with 9+ years of research and development experience on brain & mental health projects. I specialize in AI engineering, behavioral harm reduction, 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 proprietary ML algorithms** that use data from **m**ultiple devices to facilitate treatment and evaluate patient outcomes, **promoting control of personal data and compensation for its use in provider training**. I led the project through proof-of-concept, coordinating team members 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.

Harm Reduction Coaching, at The Helpers (2017 - Present)

Many face difficulties with executive functioning, risky behavior, and staying accountable to their own health goals, yet cannot afford psychotherapy or are in need of more regular support than psychotherapy can provide. I **co-founded a behavioral coaching company that offers confidential support** to clients via daily reminders of actionable steps toward goals, mood and behavioral tracking, and crisis planning, **providing low-cost and pro bono services to financially vulnerable clients**. I've led company operations through recruitment of our committed, ethnically- and gender-diverse team of coaches and **implemented strategies to reduce systemic biases and ensure fairness in our protocols for client matching and promotion of coaches**.

WORK EXPERIENCE

Data Scientist, Automated Sleep Staging
Jan 2025 – Aug 2025

Insai ApS

Lead engineer of an automated sleep staging platform for use on sparse EEG. Designed project proposal exploring methodological best practices in artifact handling, data augmentation, and model building. Regularly consulted with C-Suite executives to adapt project through changing business requirements. Implemented 12 candidate models and tests for uncertainty, robustness to noise, and subgroup analysis.

Created a sleep staging algorithm that outperformed state-of-the-art models, achieving a macro F1-score of 81.9%. Cohen's κ of 92.4% and an accuracy of 96.5%, a mean **15.8% improvement in accuracy over the top-performing published model** on DCSM and DOD benchmark datasets.

Data Scientist, Biomarkers of Ayahuasca Therapy
Mar 2023 – Present

Brain Institute, Federal University of Rio Grande do Norte

Lead investigator on a project characterizing physiological effects of ayahuasca therapy for treatment-resistant depression. Designed study proposals, preprocessed EEG and engineered features of activity, connectivity, and complexity using Brainstorm and SciPy. Engineered pipeline for neuromarker discovery using mass univariate analyses and machine learning classifiers. Coordinating remotely with international study team to discuss and disseminate critical results.

Founder & CEO, Mental Health Scientific Consulting
Sep 2022 - Present

Neurorepara, L.L.C.

Founder to a company that supports the development of projects that seek neuroscientifically- and socially-informed solutions to mental health problems. Managed business development, designing content marketing strategy and spearheading client outreach. Providing services in data modeling, exploratory data analysis, software engineering, and study design to clients in digital therapeutic and psychiatric research organizations.

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 Jul 2019 – Feb 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 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 – Present

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**.

Research Assistant, Ketamine-Assisted Psychotherapy Jan 2017 – May 2017

Substance Use Research Center, Columbia University Psychiatry & New York State Psychiatric Institute

Aided the investigation of efficacy of ketamine-assisted motivational enhancement therapy and mindfulness-based relapse prevention. Interviewed patients about dimensions of their addiction disorders and monitored patients for adverse events during medication infusion sessions.

Clinical Research Associate, Psilocybin-Assisted Psychotherapy Aug 2015 – Jun 2016

Center for Psychedelic Medicine, NYU Langone Medical Center

Developed thematic analysis of reports from patients in psilocybin-assisted psychotherapy in MATLAB. Designed study proposal to assess relationship between feelings of unity and moderated craving of alcohol. **Presented research at NYU Dean's Research Conference** 2016.

VOLUNTEERING

Co-Lead, BIPOC Psychedelic Community Group Jun 2021 – Apr 2023

Global Center for Academic and Spiritual Life, New York University

Co-organizer for a virtual community gathering space for black and brown professionals who work with psychedelics to identify and create communal cultural projects using asset-based community development approach.

Founder & Organizer, BCCN Master's Journal Club Jan 2019 – Nov 2019

Global Center for Academic and Spiritual Life, New York University

Organized flexible-format journal club for master's students to gain presentation experience in a low-pressure environment and discuss their research passions on topics of machine learning, electrophysiology, cytoarchitecture and more.

Event Manager, Syrian Refugee Awareness Week Oct 2015 – May 2016

Global Center for Academic and Spiritual Life, New York University

Programmed events for aid collection and education about the Syrian Refugee Crisis. Directed design of promotional materials and **curated panel of multidisciplinary activists to discuss action-oriented ways the university community could help refugees**.

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, lifelines), *Statistics* (Statsmodels, Pingouin)
Bash	-
R	*Data Manipulation* (dplyr), *Visualization* (ggplot2), *Modeling* (lme4, Rstan, maxLik)
MATLAB	*Neuroimaging Analysis* (Brainstorm, FieldTrip, Chronux)
LaTeX	*Typesetting* (amsmath, apacite, mathtools)
JavaScript	Bootstrap
HTML/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)

PUBLICATIONS & PRESENTATIONS

Serin E, Zalesky A, Matory A, et al. **NBS-Predict: A Prediction-based Extension of the Network-based Statistic.** Neuroimage (2021), doi: 10.1016/j.neuroimage.2021.118625

Matory AL, Alkhachroum A, Chiu WT, et al. **Electrocerebral Signature of Cardiac Death.** Neurocrit Care (2021), doi: 10.1007/s12028-021-01233-010.1007/s12028-021-01233-0

Sven O, Matory A, & Rolfs M. **Quantifying perceptual efficiency of data visualizations.** TeaP Conference of Experimental Psychologists 2020, doi: 10.23668/psycharchives.5176 (Conference abstract)

Claassen J, Doyle K, Matory A, et al. **Detection of Brain Activation in Unresponsive Patients with Acute Brain Injury.** New England Journal of Medicine (2019), doi: 10.1056/NEJMoa181275710.1056/NEJMoa1812757

Rohaut B, Reynolds A, Igwe K, et al. **Deep structural brain lesions associated with consciousness impairment early after hemorrhagic stroke.** Scientific Reports (2019), doi:10.108/s41598-019-410

Matory A, Chiu W, Alkhachroum A, et al. **Death is Not Binary: An Exploratory Study of Deceased Patients in a Neurological ICU.** IRCN Neuroinspired Computation Course 2019, University of Tokyo (Poster presentation)

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.

EDUCATION & AFFILIATIONS

Psychology BA Aug 2012 – May 2016

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

Computational Neuroscience MSc Oct 2018 – Mar 2021

Technische Universität & Humboldt Universität – *Berlin, Germany*

Computational Precision Health PhD Sep 2024 – Present

UC Berkeley & UC San Francisco – *Berkeley, CA*

Black in Neuro, Member **Black in AI**, Member

CONTINUING EDUCATION

Undoing Racism Workshop Sep 2023

People's Institute for Survival and Beyond

Three-day interactive workshop designed to teach participants to **analyze how relationships between class, power, institutions, communities, and people lead to the maintenance of disparate racial outcomes.** Through Self-analysis, then analysis of structures of power and privilege that hinder social equity, participants were prepared to be effective organizers for justice.

Computational Psychiatry Course Sep 2022

University of Zurich & ETH Zurich

Five-day course designed to provide attendees the necessary toolkit to master challenges in computational psychiatry research, teaching theories of computational modeling and demonstrating applications of open source software to example datasets.

CONTINUING EDUCATION

SQL for Data Science May 2021

University of California, Davis & Coursera

Four-week course designed to give a primer in the fundamentals of SQL – queries, filters, and table creation as well as data governance and profiling.

IRCN Neuro-inspired Computation Course Mar 2019

University of Tokyo

Four day event designed to inspire attendees to explore synergy between computer science and neuroscience, featuring lectures on brain and computer architecture, dynamical neural networks, machine and deep learning, brain development and disorders, and reinforcement learning. Used feedback from the research poster I presented to inform my master's thesis

Machine Learning Nov 2016 – Jan 2017

Stanford University & Coursera

An 11-week course giving a broad introduction to the mathematics behind and applications of machine learning, data mining, and statistical pattern recognition.

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)