Ana Ferariu

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Machine Learning researcher with experience building and evaluating ML systems for biomedical data, bridging statistical modeling, deep learning, and production deployment.

SKILLS

- **Quantitative Skills:** Decision Trees, Regularized Regression, Support Vector Machine, Ensemble Learning, Neural Networks, Moderation Analysis, Multilevel Modeling, Longitudinal Data Analysis, Predictive Modeling, Time Series Analysis, Latent Class Analysis, Survival Analysis, Functional Regression, Bayesian Analysis, Structural Equation Modeling, Multivariate Analysis, A/B testing, Large Language Models, Embeddings, Foundation Models, Qualitative Interaction Trees, Gradient-based Tree Models (XGBoost, LightGBM).
- **Software:** R, RMarkdown, Python (PyTorch, Tensorflow, Numpy, Pandas, Matplotlib), SAS (BASE, SGRAPH, STAT, MACRO, IML, IML+), SQL, Snowflake, Bedrock AWS, Matlab, Git, LaTeX.
- **Teaching:** Calculus II, General Psychology, Abnormal Psychology, Developmental Psychology, Experimental Psychology, Statistical Methods in Psychology.
- **Languages:** Romanian (native), German and English (fluent), Italian and Spanish (elementary)

RELEVANT EXPERIENCE

Proscia, Inc. - AI and Data Science Intern
Supervisors: Corey Chivers, PhD, Ajay Basavanhally, PhD **June - October 2025**

- Contributed to ML/NLP methods that transformed unstructured clinical text into structured, queryable data for a production healthcare analytics platform.
- Identified gaps in product workflows, framed them as research problems, and developed statistically rigorous solutions that were adopted in real-world systems.
- Translated advanced modeling into deployed capabilities by building reproducible prototypes, validating model behavior, and collaborating with engineers to operationalize methods.
- Developed scalable analytics pipelines that continue to extract medical insights from thousands of records daily, directly informing product functionality and data workflows.

Quantitative Psychology and Statistics Lab - Drexel University
Supervisor: Fengqing (Zoe) Zhang, PhD **September 2022 - present**

- Lead quantitative analyst on ABCD neuroimaging and behavioral datasets (over 10,000 participants), integrating multimodal MRI, behavioral, and clinical variables.
- Applied advanced machine learning methods (e.g., neural nets, interpretable models, ensemble learning) to model brain network structure and predict early substance use trajectories over time.
- Designed and implemented statistical models including latent class analysis and multilevel modeling to uncover developmental patterns and unobserved subgroups.
- Developed and validated explainable AI pipelines for predicting early alcohol use trajectories from multimodal neuroimaging features in the ABCD dataset.
- Collaborated with interdisciplinary teams of statisticians, neuroscientists, and clinicians to translate machine learning findings into developmental neuroscience insights.
- Led subgroup identification analyses in a behavioral weight-loss trial, using qualitative interaction modeling to uncover participant characteristics associated with differential response to mindfulness- and acceptance-based components.

Division of Biostatistics and Bioinformatics - Jefferson University
Supervisor: Inna Chervoneva, PhD **June - August 2024**

- Analyzed high-dimensional imaging data to identify biomarkers for lung cancer prognosis.
- Evaluated ML vs. classical statistical methods for survival analysis.
- Attended Protocol Review Meetings for clinical trials of oncologic pharmaceuticals.

PUBLICATIONS

Ferariu, A., Chang, H., Kumar, A., Sahl, A., Gorka, S., Wang, L., Thompson, W. K. & Zhang, F. (2025). Integrating Multilevel, Multidomain and Multimodal Neuroimaging Factors to Predict Early Alcohol Exposure Trajectories Using Explainable AI. Developmental and Clinical Neuroscience, Impact factor: 4.9, 75, 101597. https://doi.org/10.1016/j.dcn.2025.101597

Ferariu, A., Chang, H., Taylor, A., & Zhang, F. (2024). Alcohol sipping patterns, personality, and psychopathology in Children: Moderating effects of dorsal anterior cingulate cortex (dACC) activation. Alcohol, Clinical and Experimental Research, Impact factor: 2.7, 48(8), 1492–1506. https://doi.org/10.1111/acer.15393

Taylor, A., Sahl, A., Chang, H., **Ferariu, A.**, Wang, L., Jiang, W., McMillan, C. T., Shardell, M. D., & Zhang, F. Z. (2025). Basic Science and Pathogenesis. Alzheimer's & dementia, Impact factor: 11.1, 21. https://doi.org/10.1002/alz70855-103465

Chang, H., Widjaja, R., Yang, A., **Ferariu, A.**, Taylor, A., Kounios, J., Friedman, E., McMillan, C. & Zhang, F. (2026+). Impact of Brain and Biological Development Indices on Childhood Physical, Mental, and Academic Outcomes.Journal of Child Psychology and Psychiatry, Impact factor: 6.1, submitted.

Chang, H., Street, K., **Ferariu, A.**, Taylor, A., Kounios, J., Friedman, E., McMillan, C. & Zhang, F. (2026+). Individualized Pace of Biological Aging as a Health Biomarker in Youth with Perinatally-Acquired HIV. Journal of the American Academy of Child and Adolescent Psychiatry, Impact factor: 9.5, submitted.

Ferariu, A., Chang, H., Sadeghi, F., Sahl, A. & Zhang, F. (2026+). Do changes in brain structure and behavior over time predict the increase of substance use during adolescence?. [in prep]

Ferariu, A., Forman, E., Hagerman, C., Butryn, M. L., Choo-Kang, D., Chang, H., Sadeghi, F., Sahl, A. & Zhang, F. (2026+). Personalizing Behavioral Weight Loss: Identifying Subgroups Responsive to Mindfulness- and Acceptance-Based Treatment (MABT) Components. [in prep]

POSTER PRESENTATIONS

Chang, H., Kumar, A., Suh, J., Street, K., **Ferariu, A.**,Taylor, A., Wang, L., Patel, K., Brummel, S., Williams, P. & Zhang, F. (October 2025). Investigating Pace of Biological Aging as a Mental and Physical Health Biomarker in Youth with Perinatally-Acquired HIV. *The 16th ACM Conference on Bioinformatics, Computational Biology, and Health Informatics (ACM-BCB)*. Philadelphia, PA.

Ferariu, A., Chang, H., Taylor, A. & Zhang, F. (August 2024). A Multi-Modal Neuroimaging Study on the Prediction of Alcohol Sipping Patterns in Children: Results from the ABCD Study. *Computational Cognitive Neuroscience Conference*. Boston, MA.

Ferariu, A., Chang, H., Taylor, A. & Zhang, F. (March 2024). The Role of Dorsal Anterior Cingulate Cortex (dACC) in the Relationship between Early Alcohol Sipping Patterns and Personality Traits & Psychopathology. *ABCD Insights and Innovations Meeting*. Bethesda, MD.

Culbertson, W.C., Zillmer, E.A., & **Ferariu, A.** (October 2023). Neuropsychological Problem-Solving Styles on the Tower of London. *National Academy of Neuropsychology, 43rd Annual Conference*. Philadelphia, PA.

Bradt, J., Leader, A., Worster, B., Myers-Coffman, K., Bryl, K., Biondo, J., Schneible, B., Cottone, C., Selvan, P., Cephas, A., Millstein, A., Sofield, S., Low, M. Y., Lacson, C., **Ferariu, A.** & Zhang, F. (September 2023). Music Therapy for Chronic Pain Management in Cancer Care. *Society for Integrative Oncology, 20th International Conference*. Banff, Alberta, Canada.

Ferariu, A., Chang, H., Taylor, A. & Zhang, F. (May 2023). The Effects of Early Alcohol Consumption on Mental Health Outcomes: Results from the ABCD Study. *Statistical Methods in Imaging Conference*. Minneapolis, MN.

Chang, H., Taylor, A., **Ferariu, A.** & Zhang, F. (May 2023). Investigating Biological and Brain Age in Children in the Adolescent Brain Cognitive Development (ABCD) Study. *Statistical Methods in Imaging Conference*. Minneapolis, MN.

COURSE PROJECTS & ARTICLES

Deep Learning, Dr. Matthew Burlick - Drexel University **Spring 2025**

- Building a RNN-framework in Python to Predict Adolescent Substance Use from Triple-Network Connectivity

Clinical Neuroscience, Dr. Aaron Kucyi - Drexel University **Winter 2023**

- Atypical Antipsychotic Augmentation in Treatment-Resistant Patients with Anorexia Nervosa: Critical Analysis

Survival Analysis, Dr. Zekarias Berhane - Drexel University **Fall 2022**

- The Effect of D-penicillamine in Late-Stage Cirrhosis in a Randomized Control Trial from January 1974 to May 1988

Cognitive Neuroscience, Dr. Evangelia Chrysikou - Drexel University **Fall 2022**

- The Pathway to Alcoholism from Early Alcohol Exposure and Its Effects on Executive Functioning

Statistical Programming, Dr. Ping-Shi Wu - Lehigh University **Spring 2022**

- Implementing Model Selection Functions in Python for Forward, Backward and Stepwise Selection Methods

Linear Models in R, Dr. Zhaoxing Gao - Lehigh University **Spring 2021**

- The Effects of Internet Use on Depression Rates: Results from Linear Regression

GRADUATE TEACHING EXPERIENCE

Department of Psychology - Drexel University **September 2022 - present**

- Teaching Assistant for the Statistical Methods in Psychology course, Fall 2024 and Winter 2025
- Teaching Assistant for the Experimental Psychology course, Spring 2024
- Teaching Assistant for the Developmental Psychology course, Spring 2023
- Teaching Assistant for the General Psychology course, Winter 2023 and Fall 2023
- Teaching Assistant for the Abnormal Psychology course, Fall 2022, Winter 2024 and Spring 2025
  - Responsibilities: Served as lead instructor for 4 General Psychology lectures in auditoriums of 200+ students; led Abnormal Psychology lab sections; developed case studies; graded assignments; managed course logistics including attendance and office hours

Department of Mathematics - Lehigh University **January 2022 - May 2022**

- Teaching Assistant for the Calculus II with Business Applications course, Spring 2022
- Teaching Assistant at the Mathematics Help Center, Spring 2022
  - Responsibilities: led Calculus II recitations; developed exams; graded homeworks; managed course logistics including attendance and office hours

AWARDS

- College of Arts & Sciences Dean's Fellowship, Drexel University, September 2022 - June 2024
- Dean's Scholarship Award - Dept. of Mathematics, Lehigh University, August 2020 - May 2022
- Women's Basketball Full Athletic Scholarship, Drexel University, September 2016 - June 2020
- "Maureen Cronin Spirit and Leadership" Award, May 2019
- CAA "Rookie of the Week" and USBWA National Freshman Award in December 2016
- Multiple "Best 5" and "Best Scorer" Awards and multiple medals in Romania's Basketball League

PROFESSIONAL MEMBERSHIPS

- American Statistical Association (ASA), Member (2022 – present)

EDUCATION

Drexel University, Philadelphia, PA **September 2022 - June 2027 (expected)**
Doctorate in Applied Cognitive and Brain Sciences

Drexel University, Philadelphia, PA **September 2022 - December 2024**
Masters of Science in Psychology

Lehigh University, Bethlehem, PA **August 2020 - May 2022**
Masters of Science in Statistics

Drexel University, Philadelphia, PA **September 2016 - June 2020**
Bachelor of Science in Mathematics

EXTRACURRICULAR

- Mentor for Student-Athletes at the NGO Crazy Rich Athletes (January 2022 - present)
- Neurohackademy Participant, Seattle, WA (August 2023)
- Graduate Assistant for the Deputy Provost of Graduate Education, Dr. Yueling (Oliver) Yao (August 2021 - May 2022)
- Director of Education at Lehigh Coffee Club (September 2021 - May 2022)
- Lead Speaker at Lehigh's International Career Perspectives Roundtable - March 2021
- Member of Romania's Olympic Basketball team (November 2015 - July 2020)
- Member of Drexel's Women Basketball team (September 2016 - June 2020)