Madison MacDonald

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EDUCATION

University of California, Berkeley – Berkeley, CA — May 2026
Master of Arts in Statistics — Current GPA: 3.9/4.0

Purdue University – West Lafayette, IN — December 2024
Bachelor of Science in Applied Statistics, Minor in Psychology — Major GPA: 4.0/4.0
Overall GPA: 3.96/4.0

Relevant Coursework

- Statistical Computing with Python, Advanced Statistical Theory (Bayesian & Frequentist), Advanced Probability Theory, Linear Models, Time Series & Regression Analysis, SAS Statistical Programming & Data Management, Data Analysis & Machine Learning

Academic Awards

- The Honor Society of Phi Kappa Phi, Mu Sigma Rho National Honorary for Statistics, National Society of Collegiate Scholars

PROFESSIONAL EXPERIENCE

University of California, Berkeley – Berkeley, CA — January 2026 – May 2026
Graduate Student Instructor

- Facilitated weekly discussion sections by reviewing core course material, guiding collaborative problem-solving activities, and developing structured review resources to reinforce statistical concepts and support exam preparation
- Provided individualized academic support through office hours, small-group tutoring, and responsive student communication, strengthening comprehension, confidence, and overall course performance

University of California, Berkeley – Berkeley, CA — August 2025 – May 2026
Outreach Peer Ambassador

- Led recruitment efforts for UC Berkeley's MA Statistics program at information sessions and national conferences, engaging with prospective students and enhancing program visibility and interest
- Counseled prospective graduate students through the application process with tailored advice, empowering them with strategies and resources that boosted applicant preparedness and confidence

Purdue University and West Lafayette Schools – West Lafayette, IN — September 2017 – May 2025
Private Mathematics Tutor

- Collaborated with 10-15 students to tackle class challenges by identifying lagging skills and providing targeted assistance
- Developed comprehensive practice materials that improved exam performance for participants
- Enhanced peer understanding by leading group study sessions for undergraduate and graduate-level statistics coursework

The Data Mine Purdue University – West Lafayette, IN — September 2023 – December 2024
Undergraduate Data Science Researcher

- Led a 5-person Data Analytics sub-team in partnership with the American Mathematical Society, cleaning and analyzing large survey datasets using Excel, SQL, and Tableau, and delivering weekly presentations to AMS stakeholders on complex technical findings
- Built an interactive, public-facing AMS website dashboard that replaced static PDFs with a dynamic, user-friendly tool for exploring survey trends, and designed an efficient database to streamline data transfer from FileMaker Pro

PROJECTS

- **PECARN Pediatric TBI Risk Analysis:** Cleaned and validated a 43,000-patient emergency department dataset against published clinical benchmarks. Built three classifiers (PECARN decision rule, logistic regression, and random forest) to predict clinically important traumatic brain injury and found that physician-assigned injury severity is a poor proxy for actual brain injury risk (e.g., bicycle crashes carried higher ciTBI rates than motor vehicle crashes).

- **Human vs. AI Text (Cultural Analytics Pipeline):** Applied supervised classification and topic modeling (BERTopic and LDA to a 788,922-text corpus of human and LLM-generated writing, finding that TF-IDF features alone distinguished the two classes with macro F1 = 0.862. The most telling result was structural, namely that human writing is anchored in specific dates, citations, and institutional vocabulary, while AI writing operates at a level of abstraction, flagged by words like *potential, significant, and ultimately,* which held up across every model and chunking strategy tested.

SKILLS

- **Programming Languages:** SAS | Python | R | SQL | MATLAB | SPSS | LaTeX | Shell (UNIX)
- **Technical:** Data Cleaning & Preprocessing | Python Data Science Frameworks (e.g., NumPy) | Data Visualization (Tableau, Plotly) | Applied Machine Learning (e.g., Scikit-learn, TensorFlow, PyTorch) | NLP (e.g., BERT, LDA) | ETL & Data Pipeline Development | Git & GitHub Version Control | Advanced Statistical Modeling | Regression & Time Series Analysis | A/B & Hypothesis Testing