

# Jake Weber

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## Summary

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PhD candidate in Mathematics and MS candidate in Computer Science at Louisiana State University, specializing in structural graph theory, system decomposition, graph algorithms, and optimization. Experienced in cross-functional collaboration, project execution, formalizing complex systems and processes, and implementing streamlined strategies to maximize operational efficiency. Optimizes systems to create impact and opportunity for all users. Eager to jump into roles as a Research Scientist, Algorithms Engineer, Data Scientist, or Project Manager while bringing brains, hustle, and flair.

## SKILLS & CERTIFICATIONS

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- Languages: Python, Perl, SMLNJ, Prolog, HTML, Lean, SQL, LaTeX, Mathematica, MatLab, and Maple
- Libraries: Jupyter Notebook, Sage Math, NumPy, Pandas, Keras, TensorFlow
- Platforms: Photoshop Elements, Adobe InDesign, OMNI CMS (email and web design), Canva
- Awards: [LSU Certificate of Teaching Excellence](#) (F25, S24), LSU Graduate Student Leadership Initiative, LSU Summer 2025 Math RA, UNI Graduate Assistant First Award, [UNI Purple and Old Gold Meritorious Award](#), [SL Math Sciences Institute Graduate Summer School: Formalization in Mathematics](#)
- Soft Skills: Self-motivated and curious professional with experience leading projects, planning agendas, and mentoring others. Operates with attention to detail while being receptive to feedback, resilient, and adaptable in collaborative environments. Writes precisely for technical documents, and provides feedback to improve team outcomes.
- Certifications: Intermediate Level Tutor by National Tutoring Association, Property Casualty Insurance License (Iowa)

## SELECTED PROJECTS

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### **Classes Between Line Graphs and Claw-free Graphs, Louisiana State University** **Spring 2026**

- We characterize graph classes using precise decomposition/construction algorithms by describing forbidden substructures. We provide tools that describe ~30 classes between the two listed. After using SageMath in Python for conjecture experiments, the project was formalized with mathematical rigor and proof. Compared to prior characterizations of these classes, this approach uses half the number of graph operations, infinite graph classes, and standalone graphs. [\[LINK\]](#)

### **Social Choice Theory: An Application on Voters of the Associated Press (AP) Top 25 NCAA Football Rankings, Louisiana State University** **Spring 2026**

- Our goal is to describe how individuals impact group decision-making processes. We model the social dynamics of the voters of the AP Top 25 NCAA Football Poll using graph theory. After acquiring voter data, we use Python to clean the data, implement a formalization of agreement/social dominance, and use graph structures to explain the social dynamics of the group. We were able to describe the dynamic's change over a given season, isolate which voters were most influential/diplomatic, and how this dynamic might change the post-season seeding. [\[LINK\]](#)

### **Geauxing Places Blog and Website Development, Louisiana State University** **Fall 2023**

- To increase program visibility and enrollment, I engaged prospective students by highlighting successful STEM alumni, starting with an initial class of ten graduates. From leaders in the classroom to STEM PhDs to MDs, I selected, interviewed, and wrote stories about program alumni. I constructed webpages to house the blog, allowing for cross-referencing within the College of Science and LSU as a whole, quickly making it the most visited program webpage. [\[LINK\]](#)

### **The Genetic Algorithm: Relevance Beyond Biology, University of Northern Iowa** **Spring 2016**

- My team's goal was to build a tool that would maximize profit and plane utilization for a travel agency that plans NCAA team travel. In Perl, we deployed a novel genetic algorithm using reinforcement learning to find an optimal schedule, yielding schedules with a 50-70% reduction in repositioning cost.

## LEADERSHIP EXPERIENCE

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### **Sigma Phi Epsilon - Iowa Theta and Louisiana Beta** **2015 – Present**

Alumni Volunteer Corporation (AVC) Secretary & Undergraduate VP of Finance

- Ensured smooth executive transitions, maintained operational quality, and offered a scalable model for peer

chapters by formalizing all Chapter Counselor workflows (e.g., working with local and national stakeholders, mentoring chapter leaders and their administration, attending and hosting monthly events).

- Biweekly collected agendas, scribed minutes, and conveyed business happenings of the AVC board to all board members and undergraduates for transparency and goal follow-through.
- Resulting in zero outstanding debts/collections, improved transparency, and streamlined onboarding (3 trained successors in budgeting/ leadership/organizational management), composed a VP of Finance transition guide.

### **LSU Math Department: Student Colloquium Committee and GEAUX Orientation**

**2021 – Present**

#### Board Member & Volunteer

- Coordinated speaker proposals, invitations, marketing, and logistics for ~4 academic talks from faculty in various math disciplines per semester, increasing faculty/graduate student engagement and research progress. [\[LINK\]](#)
- Launched an HTML website to centralize exam prep resources for 100+ graduate students across all LSU math disciplines; incorporated feedback from students/faculty to guarantee product efficacy. [\[LINK\]](#)
- Positioned 5 math graduate students for and participated in panel discussions (Surviving Graduate School, Teaching, and Mental Health/Wellness) for the incoming class, helping new graduate students have a successful transition to graduate school, LSU, and Louisiana.

## **WORK EXPERIENCE**

### **Louisiana State University: Baton Rouge, LA**

**2020 - 2026**

#### Teaching & Supporting Effective Educator Development (SEED) Grant Graduate Assistant

- Strengthened freshman engagement and performance resulting from question-driven learning and aiding college transition as Purple LSU Math Lab Tutor Manager where 250 students and 5 colleagues were managed at a time.
- Nurtured student growth in Calculus 1 & 2 by providing feedback through formative assessment to reinforce skills learned through in-class instruction, peer collaboration, and tailored group work/study guides for 40 students. Bolstered communication skills with in-class presentations.
- Developed 2 future math educators into masters of delivering inspiring and accurate calculus lessons while enhancing grading practices, classroom management techniques, and lesson-planning/presentation skills.
- Engineered and executed marketing and recruitment initiatives. Increased enrollment in the specialized teaching pathway by 300% to 15 students and College of Engineering student participation by 400% to 12.
- Leveraged and built relationships with ~20 key campus stakeholders across colleges, departments, and offices to boost program awareness and recruitment. Acted as a liaison to the College of Science Communications Committee, maintaining the whole program's 10-page website/website redesign, launching and creating the Geauxing Places Alumni Blog with 10 initial entries, making the website a centralized go-to resource. [\[LINK\]](#)
- Improved academic success and program satisfaction via coordinating logistics for biweekly recruitment events, advising on program strategy, and providing professional development for current students.

### **University of Northern Iowa: Cedar Falls, IA**

**2018 - 2020**

#### Graduate Teaching Assistant

- Managed simultaneous learning needs of at least 15 students over 20 different courses using inquiry-based instruction to promote critical thinking, active learning, and collaborative group engagement. Proactively identified and addressed student challenges using past coursework, textbooks, and additional resources. Coordinated lab schedules and graduate assistant involvement to maintain lab operation. Provided detailed and constructive feedback for 5 mathematics courses, each with ~40 students.

### **PDCM Insurance: Waterloo, IA**

**2015 - 2018**

#### Personal Lines Processing Coordinator

- Implemented Excel programs to streamline commission reporting from 8 companies with over 20 products, improving account manager accuracy and time efficiency.
- Instituted gathering and analysis of monthly call/visit data from 10 staff members into an Excel report, presenting actionable items on staffing requirements for effective client management to the CEO and COO.

## **EDUCATION**

Louisiana State University, Mathematics PhD	(GPA = 3.90)	May 2026
Louisiana State University, Computer Science: Systems Science MS	(GPA = 3.90)	May 2026
Louisiana State University, Mathematics MS	(GPA = 3.90)	Dec 2022
University of Northern Iowa, Mathematics MA	(GPA = 4.00)	May 2020
University of Northern Iowa, Mathematics BA	(GPA = 3.96)	May 2018

**Interests:** Running, biking, swimming, bowling, tennis, playing saxophone/trumpet, crocheting, cribbage, SET, and am a tea enthusiast