

# 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. Effectively communicates technical concepts to nontechnical audiences. Views system optimization as a means to unlock potential, creating greater freedom and opportunity for users. Eager to jump into roles as a Research Scientist, Algorithms Engineer, Software Developer, or Project Manager while bringing brains, hustle, and flair.

## SKILLS & CERTIFICATIONS

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- Languages: Python (Jupyter Notebook, Sage Math, NumPy, Pandas, Keras, TensorFlow), Perl, SMLNJ, Prolog, HTML, Lean, SQL, LaTeX, Mathematica, MatLab, and Maple
- Platforms: Photoshop Elements, Adobe InDesign, OMNI CMS (email and web design), Canva
- 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. Communicates effectively across audiences, 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)
- Awards: [LSU Certificate of Teaching Excellence](#), UNI Graduate Assistant First Award, [UNI Purple and Old Gold Meritorious Award](#), [Simons Laufer Mathematics Sciences Institute Graduate Summer School: Formalization in Mathematics](#)

## LEADERSHIP EXPERIENCE

### Sigma Phi Epsilon - Iowa Theta and Louisiana Beta

2018 – Present

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

- Documented all Chapter Counselor workflows (e.g., working with local and national stakeholders, mentoring chapter leaders and their administration, attending and hosting monthly events) to ensure smooth executive transitions, maintain operational quality, and offer a scalable model for peer chapters.
- 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.
- Composed a VP of Finance transition guide resulting in zero outstanding debts/collections, improved transparency, and streamlined onboarding; trained 3 successors in budgeting, leadership, and organizational management.

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

2021 – Present

#### Board Member & Volunteer

- Coordinated speaker proposals, invitations, marketing, and event logistics for academic presentations from faculty in various math disciplines, 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 ensure product efficacy. [\[LINK\]](#)
- Prepared 15 fellow math graduate students for participation in panel discussions for the incoming class to help new graduate students have a successful transition to graduate school, LSU, and Louisiana.

## WORK EXPERIENCE

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### Louisiana State University: Baton Rouge, LA

2020 - 2026

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

- Taught interactive College Algebra lessons to 40 students through patient, question-driven learning. Holistically aided student college transition and acted as Purple LSU Math Lab Tutor Manager, managing 250 students and 5 colleagues at a time, resulting in student satisfaction and improved student performance.
- Focused on nurturing student growth in Calculus 1 by providing feedback through formative assessment methods to reinforce skills learned through in-class instruction and peer collaboration for 40 students. Bolstered communication skills with in-class presentations. Created practice group work, study guides, and exams.
- Mentored, advised, and guided 2 future secondary math educators to deliver effective, accurate, and inspiring calculus recitation sessions while enhancing students' grading practices, classroom management techniques,

lesson planning methods, and 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. [\[LINK\]](#)
- Coordinated logistics for biweekly recruitment events; advised on program strategy, mentored current students, and supported the GeauxTeach STEM student organization through ongoing professional guidance. This resulted in higher program satisfaction, increased personal confidence, and improved academic success.

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

**2018 - 2020**

Graduate Teaching Assistant

- Weekly tutored at least 15 students over 20 different courses using inquiry-based instruction to promote critical thinking and active learning. Managed simultaneous learning needs of multiple students while fostering collaborative group engagement. Proactively identified and addressed student challenges using past coursework, textbooks, and additional resources. Coordinated lab schedules and graduate assistant involvement to ensure smooth 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.

## **SELECTED PROJECTS** *(Use Paragraph format; place the goal of the project upfront; keep it less than 4-5 lines)*

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

**Spring 2026**

- Using a forbidden subgraph certificate, we characterize graph classes using precise decomposition/construction algorithms. We provide tools that describe about 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. [\[LINK\]](#), [\[VIDEO\]](#), [\[SLIDES\]](#)

**Social Choice Theory: An Application on Voters of the Associated Press (AP) Top 25 NCAA Football**

**Rankings, Louisiana State University**

**Spring 2026**

- We visualize and interpret the social dynamics of the group decision-making process amongst the voters of the AP Top 25 NCAA Football Poll. After acquiring voter data, we use Python to clean the data, implement a formalization of agreement/dominance, and use that to map the social dynamics of the group. We were able to describe the dynamics' change over a given season, isolate which voters are most influential/or diplomatic, and how this dynamic might affect the post-season seeding. [\[LINK\]](#), [\[VIDEO\]](#), [\[SLIDES\]](#)

**Geauxing Places Blog and Website Development, Louisiana State University**

**Fall 2023**

- Engaging students by highlighting STEM success stories, I initiated an alumni spotlight blog 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. [\[LINK\]](#), [\[VIDEO\]](#), [\[SLIDES\]](#)

## **EDUCATION**

Louisiana State University, Mathematics PhD	(GPA = 3.88)	2026
Louisiana State University, Computer Science: Systems Science MS	(GPA = 3.88)	2026
Louisiana State University, Mathematics MS	(GPA = 3.88)	2022
University of Northern Iowa, Mathematics MA	(GPA = 4.00)	2020
University of Northern Iowa, Mathematics BA	(GPA = 3.96)	2018

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