I GENERAL INFORMATION

A Education

- Ph.D., Computer Science, Purdue University, West Lafayette, IN, 2014-2020.
  Advisor: Christoph Hoffmann
- M.S., Computer Science, Purdue University, West Lafayette, IN, 2014-2016.
- Master (with thesis), Systems Engineering and Computation, Universidad del Norte, Barranquilla, Colombia, 2009-2012.
  Advisor: Jose Marquez Diaz
- Bachelor, Systems Engineering, Universidad del Norte, Barranquilla, Colombia, 2004-2009.

B Previous Academic Appointments

- Visiting Assistant Professor, August 2020 – August 2022, Department of Computer Science, Purdue University, West Lafayette, IN.
- Adjunct Professor, July 2010 – June 2014, Department of Systems Engineering and Computation, Universidad del Norte, Barranquilla, Colombia.

C Present Academic Appointment

- Assistant Teaching Professor, Department of Computer Science, Purdue University, West Lafayette, IN, August 2022 – Present.

D Awards and Honors

1 Internal to Purdue

- ACM Faculty Award, April 2026
- Teaching for Tomorrow Fellowship Award – Junior Fellow, November 2024

E Memberships in Academic, Professional, and Scholarly Societies

- Member, ACM.
- Member, ACM SIGCSE.
- Member, IEEE.

II DISCOVERY

A Discussion of Research

1 Scope of Research

Professor Bejarano's research program is characterized by a dual focus on computational geometry and on advancing computer science education through emerging technologies. His work seeks to bridge the gap between complex theoretical frameworks and practical, scalable applications in both structural design and the modern classroom. This research trajectory is divided into two primary pillars: Geometric Modeling of Interlocking Systems and Pedagogical Innovation in the Era of Artificial Intelligence.

Pillar I - Geometric Modeling and Topological Interlocking: Building upon his doctoral work, Professor Bejarano investigates the geometric requirements for generating Topological Interlocking Configurations (TICs). This research focuses on developing generalized algorithms, such as the Multistep Evolution Method, to generate diverse polyhedral assemblies from free-form 3D surfaces. By unifying disparate generation techniques into a single computational framework, his work provides the foundational tools necessary for architectural and engineering research into structural integrity and energy absorption. A hallmark of this pillar is the intentional inclusion of undergraduate researchers, translating high-level geometric theory into publishable computational models.

Pillar II - Pedagogical Innovation and Generative AI (GenAI): In response to the rapid emergence of Large Language Models (LLMs), Professor Bejarano has established a robust research pipeline dedicated to the responsible integration of GenAI in Computer Science education. This scope encompasses a 360-degree view of the academic ecosystem:

- Student-Centric Frameworks and Metacognition: Developing and validating methodologies like AI-Lab and Owlgorithm to preserve core algorithmic thinking. This work focuses on preventing skill degradation (the "Junior-Year Wall") by shifting the role of AI from a "solution generator" to a facilitator of self-regulated learning and metacognition.
- Instructional Design and Scalability: Creating systematic "human-in-the-loop" pipelines (GAIDE and BoilerTAI) that empower faculty and teaching staff to generate academically rigorous course content and manage the high-volume communication demands of large-scale foundational courses.
- Instructional Staff Development: Addressing the pedagogical readiness of Graduate Teaching Assistants (GTAs) through AI-simulated environments. This work, embodied in the GLOW platform and its associated Human-Defined Assessment Rubric, provides a scalable, data-driven "GTA Certification" model that prepares new instructors for the human elements of teaching, such as empathy and effective scaffolding.

Professor Bejarano contributes to the university's mission of maintaining excellence in computer science education by centering his research at the intersection of technical rigor and pedagogical innovation, while navigating the transformative shift brought about by artificial intelligence.

2 Evolution Steps for Generating Topological Interlocking Assemblies

Professor Bejarano's doctoral research established a geometric approach for generating Topological Interlocking Configurations (TIC) from free-form 3D surfaces. Upon joining the faculty, he leveraged the remaining unpublished components of his dissertation as a foundation for undergraduate research mentorship. By guiding students through the exploration of complex geometric generation, he collaborated with an undergraduate researcher (then a CS senior and currently a PhD student in Mathematics at Purdue University) to make significant contributions that led to co-authorship of a peer-reviewed article.

Their paper [BM24] 1 introduces a generalized framework for designing interlocking blocks. The core of this research is a sweep-plane algorithm that evolves a 'seed polygon' into diverse polyhedral shapes. While

traditional methods are often restricted to specific geometries, such as tetrahedra or octahedra, this Multistep Evolution Method enables the systematic creation of a much broader range of convex and concave solids.

The method utilizes "evolution steps" to translate and reshape a base polygon via specific parameters: tilting angles (Θ) and distance values (λ). These parameters dictate the rotation of the polygon's normal vector at each edge and its translation to a "far plane." The resulting intersections define the vertices of the evolved shape, which can be contracted into points, line segments, or other polygons to form the final interlocking block.

This framework successfully generalizes and unifies previous techniques, including the Tilting Angles and Height-Bisection methods (the latter being a core contribution of Professor Bejarano's PhD). By eliminating the need for manual or computational post-processing, such as manual truncation, this method provides a streamlined path for generating complex geometries. This work supports critical ongoing research into how block shape influences the structural integrity, strength, and energy absorption of topological assemblies.

3 Introducing GenAI to CS/DS/AI undergraduate students

Professor Bejarano began his appointment as an Assistant Teaching Professor in Fall 2022, the same semester that GenAI (GenAI) tools, most notably ChatGPT, were released to the public. Recognizing the immediate and disruptive potential of these tools within the traditional Computer Science academic setting, he sought to transform them into pedagogical companions rather than academic shortcuts. In this pursuit, he collaborated with graduate students who later served as the Head Teaching Assistant for CS251: Data Structures and Algorithms1, a critical core course in the curriculum.

The resulting publication [DBG24] 2 addresses the urgent pedagogical challenges posed by GenAI in foundational CS education. The AI-Lab is a structured framework designed to transition GenAI from a "shortcut" into a "tutor-like" instrument. Its primary objective is to mitigate the "Junior-Year Wall", a phenomenon in which students reach advanced coursework lacking the fundamental problem-solving and algorithmic thinking skills that are bypassed through early over-dependence on AI.

The framework categorizes constructive GenAI use into three specific roles:

1. **Tailored Support:** Utilizing GenAI to provide personalized topic introductions, diverse examples, and rephrased explanations to meet individual student learning styles.
2. **Logic and Algorithm Exploration:** Leveraging AI to identify corner cases and assist in the brainstorming phase of algorithm design without generating the final code.
3. **Code Enhancement:** Using AI for post-implementation tasks, such as generating documentation, improving readability, and explaining complex, student-authored code blocks.

Professor Bejarano and his co-authors conclude that while prohibiting GenAI is impractical, educators must provide a "scaffolded" approach with clear boundaries for responsible use. By focusing AI interaction on high-level conceptualization and post-coding refinement, the framework ensures that the core cognitive "heavy lifting" remains with the student. This work advocates a shift in assessment strategies, moving toward evaluating a student's ability to explain logic and interact critically with AI. The implementation of AI-Lab demonstrates that students can benefit from GenAI's efficiency while building the robust mental models required for success in upper-level CS.

To validate the theoretical foundations of the AI-Lab, Professor Bejarano, in collaboration with a graduate student and a Senior Data Analyst with Purdue's Institutional Data Analytics + Assessment Office, conducted an empirical study presented at SIGCSE 2025 [BDS25] 8. This work involved a large-scale implementation in the courses CS251 - Data Structures and Algorithms 1 and CS253 - Data Structures and Algorithms for DS/AI 2. By collaborating with the Center for Instructional Excellence, he demonstrated that structured GenAI integration not only mitigates academic integrity risks but also actively improves students' critical evaluation skills. This implementation serves as a scalable model for how top-tier engineering universities can modernize foundational CS education.

This work was funded by the Innovation Hub 1.

4 Introducing GenAI to CS instructors and staff

In parallel to his work on student-facing AI integration, Professor Bejarano addressed the operational challenges faced by instructors and course staff in the wake of GenAI. In collaboration with a graduate student, Professor Bejarano developed a framework to guide faculty in the responsible and efficient generation of course content, such as lecture materials, diverse examples, and multi-version assessments.

The resulting framework, GAIDE (GenAI for Instructional Development and Education), was presented in [DB24] 4. GAIDE is a systematic research-to-practice framework designed to help educators produce high-quality, diverse educational materials while significantly reducing the manual workload associated with content creation.

The framework is built upon a five-stage pipeline that ensures the instructor remains the "human-in-the-loop," maintaining total pedagogical authority over the AI's output:

- **Preparation (Targeting):** Defining specific learning objectives and the necessary scope of the content.
- **Prompt Engineering (Interacting):** Crafting precise, academically-aligned instructions for the GenAI tool.
- **Content Generation (Iterating):** Utilizing AI to produce initial drafts of lecture notes, quiz questions, or programming assignments.
- **Expert Review (Verifying):** A non-negotiable stage where the instructor critically evaluates output for accuracy, pedagogical value, and the elimination of 'hallucinations.'
- **Implementation (Finalizing):** Integrating the verified and refined content into the course curriculum.

The GAIDE framework demonstrates that GenAI can act as a "force multiplier" for faculty, enabling the rapid creation of varied assessments, such as multiple versions of an exam, that would otherwise be time-prohibitive. A central tenet of the framework is that AI-generated content must be mapped to established educational taxonomies, such as Bloom's Taxonomy, to ensure students are challenged at the appropriate cognitive level. Ultimately, the study concludes that by adopting this systematic approach, instructors can reallocate their time from administrative content creation to high-impact activities such as student mentorship and active learning interventions.

This work was funded by the Innovation Hub 1.

5 Supporting teaching assistants with AI-generated answers for discussion forums

Completing his holistic approach to GenAI integration, Professor Bejarano addressed the challenges of scaling high-quality instructional support in high-enrollment courses. In collaboration with a graduate student, a senior data analyst at Purdue's Institutional Data Analytics + Assessment Office, and undergraduate researchers, Professor Bejarano developed a platform to assist Teaching Assistants in managing course discussion forums, ensuring that student inquiries receive timely, pedagogically sound, and academically rigorous responses.

The resulting platform, BoilerTAI, is detailed in [SGS+24] 5. As a middleware solution, BoilerTAI bridges the gap between student inquiries on platforms like Piazza or Ed Discussion and the analytical power of Large Language Models (LLM). Conceptually, the platform acts as an augmented "More Knowledgeable Other", a framework rooted in Vygotsky's sociocultural theory of learning.

To maintain academic integrity, the platform utilizes a strict Human-in-the-Loop workflow:

- **Ingestion:** The platform monitors course forums for new student queries in real-time.

- **Contextualization:** The LLM is provided with course-specific data (syllabi, assignments, and notes) to ensure accuracy and relevance.
- **Drafting:** The AI generates a candidate response designed to provide scaffolding and hints rather than direct answers.
- **The "Gatekeeper" Phase:** Drafts are held in a private dashboard, invisible to students, awaiting staff intervention.
- **Review and Authorization:** A TA or Instructor reviews, edits, and authorizes the post, ensuring the final response meets the specific pedagogical tone of the course.

Professor Bejarano's implementation of BoilerTAI demonstrates a significant reduction in response latency, ensuring no student query goes unanswered even in massive course sections. Beyond efficiency, the platform ensures instructional consistency across large teaching teams and serves as a vital mentorship tool for junior TAs, who learn to craft professional responses by interacting with the AI-generated drafts. Ultimately, BoilerTAI preserves the "human touch" of instruction while leveraging AI to meet the logistical demands of modern Computer Science education.

This work was funded by the Innovation Hub 1.

6 Self-Regulated Learning in Programming Courses

By late 2024, Professor Bejarano observed a shift in the educational landscape: the rapid advancement of commercial AI tools meant that students were increasingly bypassing limited pedagogical tools in favor of more powerful, paid alternatives. Recognizing that the value of AI in education must shift from content delivery to cognitive development, he initiated a strategic pivot toward Self-Regulated Learning (SRL). In collaboration with undergraduate researchers and a graduate student, Professor Bejarano explored how AI can facilitate reflection and metacognition.

Their resulting work, Owlgorithm, moves from using AI as a content provider to using it as a facilitator for student metacognition. Owlgorithm is a platform designed to enhance the SRL process—planning, monitoring, and reflecting—by using LLMs to prompt students to critically reflect on their own problem-solving strategies. The platform and underlying SRL framework are detailed in [NCKK+26] 3.

The framework operates through a structured reflective cycle:

- **Phase-Based Prompting:** The platform intervenes at key stages (Forethought, Performance, and Self-Reflection) to ask guided questions about the student's algorithmic strategy.
- **LLM-Driven Feedback on Reflection:** Rather than merely checking code execution, the AI evaluates the *quality* of the student's reflection, identifying if a student is being overly vague or accurately pinpointing logic errors.
- **Metacognitive Scaffolding:** By enforcing a pause for reflection, the tool mitigates the 'trial-and-error' coding habits often exacerbated by GenAI, encouraging the development of robust mental models.

The study concludes that Owlgorithm successfully reverses the trend of passive "help-seeking" by demanding active cognitive engagement. Preliminary data indicate that students using the platform show a superior grasp of complex algorithmic concepts and a faster transition from "novice" to "expert" behaviors, such as systematic planning and post-mortem analysis. The framework demonstrates that AI can provide high-level metacognitive feedback at a scale previously reserved for one-on-one tutoring. Crucially, by focusing on the student's internal processing rather than the AI's output, the tool remains "future-proof" against the evolution of more powerful models.

This work was supported by the grant extension from the Innovation Hub 1 and the Department of Computer Science's support of the GoBoiler 2024 program.

7 GTA Orientation using AI-Simulated students

In Summer 2025, Professor Bejarano identified a critical gap in the preparation of Graduate Teaching Assistants (GTAs): while technically proficient, many new instructors lack the pedagogical strategies required to manage challenging classroom dynamics or assist frustrated students. To address this "readiness gap," he spearheaded the development of a GenAI-driven training "sandbox."

In collaboration with an Instructional Quality Coordinator, a Curriculum Development Specialist graduate student, and undergraduate AI majors, Professor Bejarano developed GLOW, a web-based platform that simulates parameterized student behaviors. This work, presented in [DSS+26] 7, was integrated into the department's official GTA orientation program in Fall 2025.

The GLOW framework features several key technical and pedagogical components:

- **Parameterized Personas:** AI-simulated students are customized with specific behaviors (e.g., frustrated, over-confident, or disengaged), diverse background knowledge levels, and specific course contexts to provide a realistic range of interactions.
- **Scenario-Based Learning:** GTAs are immersed in high-stakes situations, such as managing a student demanding direct answers or de-escalating frustration during a difficult debugging session.
- **Iterative Practice and Evaluation:** GTAs engage in back-and-forth dialogue to test various pedagogical strategies, such as the Socratic method, while the platform tracks their progress against a human-defined rubric.

Professor Bejarano's study found that GTAs who used GLOW reported significantly lower anxiety and greater confidence when starting their classroom duties. The platform enables instructors to identify and correct poor instructional habits, such as "over-explaining," in a low-stakes environment. By providing individualized, "mentorship-style" feedback at scale, GLOW offers a solution for large departments where manual faculty-led TA training is logistically impossible. Ultimately, this research moves beyond technical subject mastery to prepare the next generation of educators for the human element of teaching.

A critical component of the GLOW framework is the methodology for assessing GTA performance during simulated interactions. To ensure these AI-driven training sessions remain grounded in established pedagogical standards, Professor Bejarano oversaw the development of a Human-Defined Assessment Rubric. This work, detailed in [GLDB26] 6, serves as the evaluative counterpart to the GLOW platform, providing the assessment layer necessary to transform practice sessions into measurable professional development.

The framework centers on a rigorous evaluation of GTA performance across four key pedagogical dimensions:

- **Problem Identification:** The GTA's ability to accurately diagnose a student's underlying misconceptions or specific sources of frustration.
- **Scaffolding Quality:** The effectiveness of the GTA's guidance—specifically, their ability to lead students toward a solution through hints and prompts without prematurely providing the answer.
- **Tone and Empathy:** The professional and supportive nature of the communication, particularly when managing 'parameterized' difficult or frustrated student behaviors.
- **Instructional Accuracy:** The technical correctness of the GTA's explanations and their alignment with departmental course standards.

A primary conclusion of this research is that while AI can effectively simulate a student, human oversight remains non-negotiable. The rubric allows faculty and coordinators (such as the Instructional Quality Coordinator) to identify specific instructors who require targeted interventions. By tracking scores across these dimensions, the department can quantitatively assess a GTA's classroom readiness, moving away from subjective assessments.

Furthermore, the use of a standardized rubric ensures that all GTAs are held to the same high pedagogical standards, regardless of the specific student persona encountered. The study suggests that the rubric itself serves as a vital teaching tool; by reviewing their scores, GTAs gain a clear understanding of departmental

expectations regarding student-centered instruction and professional boundaries. Ultimately, the combination of GLOW and this structured assessment creates a comprehensive "GTA Certification" model that professionalizes the orientation process for high-enrollment courses.

This work was supported by a grant extension from the Innovation Hub 1 and with the collaboration from the Department of Computer Science.

B Publications

Note: ^{U} and ^{G} indicate authors who were undergraduate and graduate students, respectively *at the time of writing.*

1 Refereed

Journal Articles

1. [BM24] Andres Bejarano and Kathryn Moran^U. *"Multistep Evolution Method to Generate Topological Interlocking Assemblies."* Applied Sciences 2024, 14(15):6542. https://doi.org/10.3390/app14156542
2. [DBG24] Ethan Dickey^G, Andres Bejarano, and Chirayu Garg^G, *"AI-Lab: A Framework for Introducing Generative Artificial Intelligence Tools in Computer Programming Courses."* Springer Nature Computer Science. 5, 720 (2024). https://doi.org/10.1007/s42979-024-03074-y

Articles Refereed In Conference Proceedings

3. [NCKK+26] Juliana Nieto-Cardenas^U, Erin Joy Kramer^U, Peter Kurto^U, Ethan Dickey^G, and Andres Bejarano. 2026. *"Owlgorithm: Supporting Self-Regulated Learning in Competitive Programming through LLM-Driven Reflection"*. In Proceedings of the 57th ACM Technical Symposium on Computer Science Education V.1 (SIGCSE TS 2026), Vol. 1. Association for Computing Machinery, New York, NY, USA, 757–763. 10.1145/3770762.3772662. Acceptance rate: 30%.
4. [DB24] Ethan Dickey^G, and Andres Bejarano, *"GAIDE: A Framework for Using Generative AI to Assist in Course Content Development"*, 2024 IEEE Frontiers in Education Conference (FIE), Washington, DC, USA, 2024, pp. 1-9, doi: 10.1109/FIE61694.2024.10893132. Acceptance rate: 63%.
5. [SGS+24] Anvit Sinha^U, Shruti Goyal^U, Zachary Sy^U, Rihanna Kuperus, Ethan Dickey^G, and Andres Bejarano, *"BoilerTAI: A Platform for Enhancing Instruction Using Generative AI in Educational Forums"*, 2024 IEEE Frontiers in Education Conference (FIE), Washington, DC, USA, 2024, pp. 1-8, doi: 10.1109/FIE61694.2024.10893137. Acceptance rate: 63%.

2 Submitted

6. Houyame Lkhider, Andres Bejarano, Ethan Dickey^G, Rokaya El Gounidi, Nadia Chafiq. 2026. "Human-Authored, AI-Executed Rubric for GTA Simulation Training: Design and Early Evaluation in a Large CS Program." (Under Review)

C Other Presented Papers

Professor Bejarano's work has also been presented as posters at the SIGCSE TS in 2025 and 2026, with their respective summaries published in the ACM Digital Library.

6. [GLDB26] Quiondriya Gee, Houyame Lkhider, Ethan Dickey^G, and Andres Bejarano. 2026. "Preparing Graduate Teaching Assistants with Structured Orientation and AI-Simulated Students." In Proceedings of the 57th ACM Technical Symposium on Computer Science Education V.2 (SIGCSE TS 2026),

Vol. 2. Association for Computing Machinery, New York, NY, USA, 1347–1348. https://doi.org/10.1145/3770761.3777359. Acceptance rate: 73%.

7. [DSS+26] Ethan Dickey[G], Ashok Saravanan[U], Alexander Siladie[U], Houyame Lkhider, Quiondriya Gee, and Andres Bejarano. 2026. "GLOW: AI-Simulated Students Improve GTA Readiness." In Proceedings of the 57th ACM Technical Symposium on Computer Science Education V.2 (SIGCSE TS 2026), Vol. 2. Association for Computing Machinery, New York, NY, USA, 1291–1292. https://doi.org/10.1145/3770761.3777354. Acceptance rate: 73%.
8. [BDS25] Andres Bejarano, Ethan Dickey[G], and Rhianna Setsma. *"Implementing the AI-Lab Framework: Enhancing Introductory Programming Education for CS Majors."* In Proceedings of the 56th ACM Technical Symposium on Computer Science Education V. 2 (SIGCSE TS 2025). Association for Computing Machinery, New York, NY, USA, 1383–1384. https://doi.org/10.1145/3641555.3705201. Acceptance rate: 35%.

D Funding

Professor Bejarano's work on the inclusion of AI in Computer Science education was funded by the Innovation Hub, an office under the Vice Provost of Teaching and Learning at Purdue University. The funds received were granted thanks to the Lilly Endowment.

1 Discussion of Support

- Development of Core Skills and Teaching Practices in the Presence of AI
  - Number: IH-AI-23002
- Development of Core Skills and Teaching Practices in the Presence of AI (Extension)
  - Number: IH-AI-23002

2 Award Information

1.	Agency/Title of Grant:	Innovation Hub/Development of Core Skills and Teaching Practices in the Presence of AI
2.	Duration of Funding:	07/01/2023 - 08/01/2024
3.	Total Amount of Award:	$87,974.28
4.	Your Role:	PI
5.	Percentage of funding responsible:	100%

1.	Agency/Title of Grant:	Innovation Hub/Development of Core Skills and Teaching Practices in the Presence of AI (Extension)
2.	Duration of Funding:	08/02/2024 - 08/15/2025
3.	Total Amount of Award:	$99,373.73
4.	Your Role:	PI
5.	Percentage of funding responsible:	100%

E Evidence of Involvement of Students and Post Docs

1 Graduated M.S. and Ph.D. Students

- Chirayu Garg. He was a 4+1 BS/MS student in Computer Science at Purdue. He graduated from Purdue in Fall 2023. He took a CS590-Independent Studies course with Professor Bejarano during the Summer of 2023 to develop the AI-Lab framework. Chirayu is a co-author of [DBG24].

2 Graduate Students

- Ethan Dickey. He is a Ph.D. student in Computer Science at Purdue. Ethan was a co-PI on projects funded by the Innovation Hub to include GenAI tools in Computer Science education. Ethan is a co-author of [BDS25, DB24, SGS+24, DBG24, DSS+26, GLDB26, NCKK+26].

3 Undergraduate Students

The following are the undergraduate students with whom Professor Bejarano has worked on research and development projects. The students are grouped per project. Each student is listed with the semesters they were involved in each project:

- Development of Core Skills and Teaching Practices in the Presence of AI
  - Alex Siladie (Undergraduate, Summer 2025)
  - Ashok Saravanan (Undergraduate, Summer 2025)
  - Peter Kurto (Undergraduate, Spring 2025)
  - Erin Kramer (Undergraduate, Spring 2025)
  - Juliana Nieto (Undergraduate - GoBoiler Program (UNAL, Colombia), Fall 2024 to January 2025)
  - Libra Vento (Undergraduate - GoBoiler Program (UTEC, Peru), Fall 2024 to January 2025)
  - Vivan Tiwari (4+1 BS/MS, Summer 2024 to Spring 2025)
  - Anvit Sinha (Undergraduate, Spring 2024 to Spring 2025)
  - Shruti Goyal (Undergraduate, Fall 2023 to Spring 2024)
  - Zachary Sy (Undergraduate, Fall 2023 to Spring 2024)
  - **Notes:**
    - Juliana Nieto, Erin Kramer, and Peter Kurto are co-authors of [NCKK+26].
    - Alex Siladie and Ashok Saravanan are co-authors of [DSS+26].
    - Anvit Sinha, Shruti Goyal, and Zachary Sy are co-authors of [SGS+24].
- Shape Modeling with Differential Growth and GenAI
  - Kathryn Moran (Undergraduate, Fall 2023 to Summer 2024). Co-author of [BM24]
  - Alvin Ismael (Undergraduate, Summer 2023 to Fall 2023)
  - Ben Lilly (Undergraduate, Spring 2024)
  - Brayden Bracket (Undergraduate, Fall 2024)
  - Jinug Lee (Undergraduate, Summer 2023 to Fall 2023)
  - Rachel Ibey (Undergraduate, Summer 2023 to Fall 2023)
- Automatic Analysis of Algorithm Runtime
  - Aanya Jha (Undergraduate, Fall 2023 to Spring 2024)
  - Tzung-Ying (Denis) Hsieh (Undergraduate, Fall 2023 to Spring 2024)
  - Nilisha Bhandari (Undergraduate, Fall 2023 to Spring 2024)
  - Benson Tsai (Undergraduate, Fall 2023 to Spring 2024)

  - Jiarui Xie (Spring 2023 to Spring 2024)
  - Shubhaang Agarwal (Spring 2023 to Spring 2024)
  - **Note:** These students presented their work titled *"Tool for Runtime Analysis and Complexity Evaluator (TRACE)"*, at the Purdue Spring Undergraduate Research Conference 2024. They were awarded 3rd place in the College of Science - Research Talks category.
- Automatic Source Code Plagiarism Detection
  - Jack Hogan (Undergraduate, Spring 2023 to Present)
  - Micah Robinson (Undergraduate, Spring 2024 to Fall 2024)
  - Vinh Tran (Undergraduate, Spring 2024)
  - Ava Lyall (Undergraduate, Spring 2023 to Spring 2024)
  - Vidit Patel (Undergraduate, Spring 2023 to Spring 2024)
  - Ankush Maheshwari (Undergraduate, Spring 2023)
- Usage of Private GenAI Tools for Course Logistics
  - Anvit Sinha (Undergraduate, Fall 2023)
  - Arunima Chowdhuri (Undergraduate, Fall 2023)
  - Siwen Hu (Undergraduate, Fall 2023)
  - Yashwi Thakkar (Undergraduate, Fall 2023)

III LEARNING

A Teaching Assignments

Professor Bejarano has taught core courses for the Computer Science, Data Science, and Artificial Intelligence undergraduate programs as a Visiting Assistant Professor (from Fall 2020 to Summer 2022) and as an Assistant Teaching Professor (from Fall 2022 to Present). In 2023, Professor Bejarano also had the opportunity to teach a course for the computing requirement for students from the College of Science.

Professor Bejarano's teaching assignments are summarized in Table 1.

Semester & Year	Course Number	Title of Course	Number of Students	Student Classification
SP 2026	CS 251	Data Structures and Algorithms	215	Undergraduate
SP 2026	CS 253	Data Structures and Algorithms for DS/AI	133	Undergraduate
SP 2026	CS 290	Vibe Coding	24	Undergraduate
FA 2025	CS 176	Data Engineering in Python	29	Undergraduate
FA 2025	CS 251	Data Structures and Algorithms	56	Undergraduate
FA 2025	CS 290	Vibe Coding	21	Undergraduate
SU 2025	CS 251	Data Structures and Algorithms	53	Undergraduate
SP 2025	CS 251	Data Structures and Algorithms	289	Undergraduate
SP 2025	CS 253	Data Structures and Algorithms for DS/AI	68	Undergraduate
FA 2024	CS 251	Data Structures and Algorithms	668	Undergraduate
SU 2024	CS 251	Data Structures and Algorithms	48	Undergraduate
SP 2024	CS 251	Data Structures and Algorithms	355	Undergraduate
SP 2024	CS 253	Data Structures and Algorithms for DS/AI	64	Undergraduate
FA 2023	CS 177	Programming with Multimedia Objects	335	Undergraduate
SU 2023	CS 177	Programming with Multimedia Objects	38	Undergraduate
SU 2023	CS 251	Data Structures and Algorithms	40	Undergraduate
SP 2023	CS 177	Programming with Multimedia Objects	347	Undergraduate
FA 2022	CS 251	Data Structures and Algorithms	411	Undergraduate
SU 2022	CS 182	Foundations of Computer Science	56	Undergraduate
SU 2022	CS 251	Data Structures and Algorithms	54	Undergraduate
SP 2022	CS 251	Data Structures and Algorithms	353	Undergraduate
FA 2021	CS 251	Data Structures and Algorithms	397	Undergraduate
SU 2021	CS 182	Foundations of Computer Science	97	Undergraduate
SU 2021	CS 251	Data Structures and Algorithms	57	Undergraduate
SP 2021	CS 251	Data Structures and Algorithms	275	Undergraduate
FA 2020	CS 251	Data Structures and Algorithms	361	Undergraduate

Table 1: Teaching assignments at Purdue since Fall 2020. CS 176, 177, 182, 251, and 253 courses are 3-credit-hour lectures. CS 290-Vibe is an 8-week course offered to students as part of Professor Bejarano's research on AI in CS Education. Professor Bejarano co-taught CS 251 with Federico Cifuentes-Urtubey (Vissiting Assistant Professor) in the Fall of 2025, with Jeremiah Blocki (Assistant Professor) in the Fall of 2022, and CS 177 with Jessica Conner-Strunk (Lecturer) during the Summer and Fall of 2023.

B Selected Discussion of Courses

1 CS251 - Data Structures and Algorithms

Since his initial appointment in 2020 as a Visiting Assistant Professor, Professor Bejarano has provided sustained instructional leadership and continuity for CS251: Data Structures and Algorithms, a core second-year course for Computer Science majors. Over repeated offerings, he has guided the course through a gradual but significant pedagogical redesign. In particular, CS251 has evolved from a format centered primarily on programming practice to one that places greater emphasis on mathematical reasoning, formal analysis, and the abstract structure of canonical data structures and algorithms. This redesign reflects Professor Bejarano's view that students develop a deeper and more durable command of topics such as priority queues, dictionaries, and graphs when they understand not only how to implement these structures, but also why they behave as they do, how their properties can be analyzed, and how they can be selected and adapted in response to design constraints. His broader goal has been to help students build conceptual frameworks that transfer to later coursework and to professional practice, rather than treating data structures as isolated programming techniques.

Professor Bejarano has pursued this redesign through deliberate incremental revision rather than wholesale restructuring. Across semesters, he has made small, targeted changes to course organization, assessment design, and expectations for student performance, using each offering as an opportunity to refine how students demonstrate learning. One important line of revision has involved the structure and frequency of examinations. Beginning in Summer 2025, he increased the number of exams in the course while reducing the amount of material covered on each one. The purpose of this change was to lessen the cognitive burden associated with infrequent, high-stakes testing, especially in a course where students are asked to integrate technical detail, formal reasoning, and problem-solving under time constraints. By narrowing the topical scope of each exam, he sought to encourage more continuous study habits and to make assessment better aligned with the pace at which students encounter and consolidate core concepts.

Building on this approach, Professor Bejarano later introduced a checkpoint system consisting of short in-class assessments, approximately 40 minutes in length and administered every two weeks. These checkpoints were designed to serve several purposes simultaneously: to help students keep pace with the material, to provide more frequent and timely feedback, and to give students regular opportunities to adjust their study and review strategies before major misunderstandings became entrenched. This approach also responded to the realities of student workload and examination stress. Rather than relying on a traditional two-midterm model, which had previously required evening exams of substantial length, the checkpoint system distributes evaluation more evenly across the semester and reduces the weight of any single assessment in the final grade. Student evaluations have generally indicated that this structure is perceived positively. In particular, students have noted that the reduced scope of each assessment makes preparation more manageable, that the lower stakes of individual checkpoints reduce anxiety associated with failure, and that the cumulative structure provides a clearer sense of progress through the course.

Professor Bejarano has also used CS251 as an important setting for examining the instructional implications of GenAI in computer science education. Drawing on his work with the AI-Lab framework over seven semesters in this course, he has studied how students perceive and use AI tools in the context of learning data structures and algorithms. This work has contributed to his broader scholarly agenda on AI in computing education and has informed his classroom decisions in a concrete way. One consistent observation from his data collection has been that students report substantial AI use even in settings where such use is not explicitly authorized. In response, Professor Bejarano has chosen not to frame AI primarily as a policing problem. Instead, he has worked to design course policies that acknowledge the reality of student use while preserving the integrity of course learning outcomes and individual assessment.

This approach has led to several changes in CS251. Professor Bejarano has allowed students to use AI tools on take-home work, including quizzes, homework, and programming projects, while reducing the weight of these components to 10% each in the final grade. The purpose of this policy is not to diminish the importance of out-of-class work, but to recognize that such work now occurs in an environment where AI assistance

is readily available and difficult to separate cleanly from legitimate learning support. By shifting greater evaluative weight to in-person examinations, he has attempted to preserve a clear measure of individual mastery while allowing students to engage with AI tools in a manner that is explicit rather than covert. This policy also reflects his view that responsible and effective use of AI is itself a skill that students will need to develop, and that instruction should help shape that skill rather than ignore it. Since the introduction of this model in Summer 2025, student response has been mostly positive, as reflected in course evaluations, although Professor Bejarano continues to monitor both student performance and student perceptions closely.

In Spring 2026, Professor Bejarano began a more targeted experiment involving limited "vibe coding" components within selected programming projects. In these components, students are required to use authorized AI platforms to generate code and, if the code is faulty, to continue working through prompting and revision rather than manually rewriting the solution themselves. Students must document the provenance of their submissions by providing shared chat links or comparable evidence showing how the code was produced. The purpose of this experiment is not simply to permit AI use, but to expose students to the practical limitations of prompt-based software development, including the difficulty of specifying computational requirements precisely, diagnosing flawed outputs, and iterating effectively toward a correct solution. Although Professor Bejarano regards these experiments as preliminary, anecdotal evidence suggests that they help students engage more critically with both the affordances and limitations of GenAI as a programming aid.

Taken together, these changes illustrate Professor Bejarano's broader approach to CS251: sustained stewardship of a foundational course, careful and iterative refinement of pedagogy, and evidence-informed adaptation to changing technological conditions. His work on the course has been guided by a consistent commitment to conceptual rigor, meaningful assessment, and responsiveness to the realities of contemporary computing education. His study of AI in CS251 remains ongoing and will continue to inform future versions of the course.

2 CS253 - Data Structures and Algorithms for DS/AI

During his years as a Visiting Assistant Professor and in his first semester as Assistant Professor of Practice, Professor Bejarano observed that CS251: Data Structures and Algorithms differed notably in both performance and reception between students in the Computer Science major and those in the Data Science major. In particular, he identified a recurring difference in prior preparation among Data Science students in topics such as dynamic memory and pointer-based data structures, including linked lists and binary trees. After documenting grade patterns across majors and speaking with students about their course backgrounds, he determined that this difference was tied to the structure of the curriculum. Unlike Computer Science majors, Data Science students typically did not take CS240: Programming in C, the course in which these topics were addressed in depth, but instead followed a pathway more heavily oriented toward statistics, data analysis, and applied quantitative work.

In Fall 2022, Professor Bejarano initiated discussions with colleagues about how to address this curricular mismatch and proposed the creation of a new course in data structures and algorithms designed specifically for the preparation and needs of Data Science students, and eventually Artificial Intelligence students as well. The purpose of the course was not simply to remove material, but to reorganize the subject around a different student audience. In addition to covering core topics in data structures and algorithms, the proposed course would create room for topics of particular relevance to data-intensive and AI-oriented computing, including probabilistic data structures such as Bloom filters, Count-Min Sketch, HyperLogLog, and MinHash, as well as sparse matrices and programming projects grounded more directly in data-oriented applications. These conversations led to the creation of CS253: Data Structures and Algorithms for Data Science and Artificial Intelligence. The course was approved by the Department of Computer Science faculty and first offered in Spring 2024, and it has since become a core course for the Data Science and Artificial Intelligence majors.

The creation of CS253 also made it possible to distinguish more clearly the instructional aims of CS251 and CS253 for their respective audiences. CS251 could be directed more fully toward the needs of Computer Science majors, including a return to programming projects in C++, while CS253 could support programming

experiences in Java and Python and connect course content more directly to the kinds of computational problems students encounter in Data Science and Artificial Intelligence. Because CS253 is still a relatively new course, it currently retains some topics and approaches inherited from CS251. Professor Bejarano is therefore continuing to refine its identity in collaboration with junior teaching faculty, with the goal of making the course more distinctly data-oriented. Areas under development include probabilistic analysis of algorithms, tensors, searching and sorting in large datasets, locality-sensitive hashing, PageRank, shortest-path algorithms, A* search, and data structures that support approximate nearest-neighbor methods. Through this work, he is not only shaping the long-term direction of the course but also creating opportunities for junior faculty to contribute to curriculum development and gain experience in course design.

3 CS290 - Vibe Coding

Professor Bejarano developed CS290: Vibe Coding as a direct response to the rapid emergence of GenAI as a factor in programming practice and computing education. Since Fall 2022, he has followed these developments closely through both his teaching and his research on AI in computer science education. As AI-assisted code generation became increasingly visible in student work and in professional discourse, he identified the need for an instructional space in which students could learn to use such tools deliberately, critically, and with attention to their limitations. In Fall 2025, while assigned to teach CS251 at the Purdue Indianapolis location, he proposed and offered an eight-week special topics course on vibe coding and its implications for Computer Science, Data Science, and Artificial Intelligence. The course was intended both to teach students practical prompting strategies and to create opportunities for reflection on what changes, and what does not, when code generation is delegated to AI systems.

The first offering of CS290 enrolled 21 students drawn from Computer Science, Data Science, Artificial Intelligence, and Computer and Information Science. The course introduced students to basic prompting methods, persona and role-based prompting patterns, and the use of AI coding extensions within development environments. Students then completed four open-ended vibe coding challenges under a central rule: they were not permitted to write or manually edit code and instead had to rely entirely on AI systems to generate and revise their solutions. Although this rule was framed with some humor, it established an important pedagogical constraint. By removing manual coding as a fallback, the course required students to confront the actual demands of AI-mediated development: expressing requirements precisely, iterating on ambiguous or defective outputs, and evaluating whether generated code was correct, maintainable, and appropriate for the task. The challenges themselves required students to satisfy substantive technical conditions while leaving room for independent design choices. For example, one challenge required students to produce a client-server application while allowing them to choose the application domain. In assessing this work, Professor Bejarano collaborated with a lecturer in Indianapolis who brought substantial industry experience, and together they used student submissions as occasions to examine both the possibilities and shortcomings of AI-generated solutions.

Professor Bejarano repeated the course in West Lafayette in Spring 2026 and expanded its scope to include additional topics such as specs-driven development and MCP servers. He also added post-challenge surveys in order to collect systematic data on student perceptions and uses of AI, further integrating the course with his ongoing research agenda on AI in computer science education. At the same time, he invited a junior teaching professor to collaborate on the project and continue offering the course in Indianapolis, extending the course's impact beyond its initial pilot. Early findings from these offerings suggest that students recognize the importance of acquiring AI-related skills, but they also indicate disparities in access to licensed or paid AI tools, which has implications for equitable participation in this kind of instruction. Professor Bejarano continues to collect and analyze these data as he refines the course and develops future scholarly dissemination.

4 CS/SCI 173 - AI Competency

Professor Bejarano has played a leading role in the development of CS/SCI 173: AI Competency, a course created in response to the university's new undergraduate AI literacy requirement. His work on AI in computer science education, together with his contributions to the AI TIGER Team and to institution-wide discussions surrounding AI Foundational Learning Outcomes, led to his being asked first by the Department of Computer Science and later by the College of Science to help design a course that would satisfy these new expectations from a Computer Science perspective for students in the College of Science. Working collaboratively with faculty and colleagues across the college, and the College of Liberal Arts, he helped formulate what is now CS/SCI 173.

The course is intended to provide students with a principled introduction to AI literacy that is appropriate for a broad undergraduate audience while remaining grounded in core computing concepts. Its learning outcomes emphasize several interconnected areas: understanding the growing role of algorithmic and AI systems in professional and societal settings; distinguishing deterministic software from probabilistic AI models; explaining the basic AI pipeline, including data curation, model training, and inference; recognizing the ethical and practical consequences of design choices; evaluating the reliability and trustworthiness of AI-generated outputs; using prompting and decomposition techniques responsibly; documenting AI-assisted workflows in a transparent manner; and developing a reflective framework for human-AI collaboration within one's own discipline. In this sense, the course is designed not simply as a technical overview, but as a foundational literacy experience that connects conceptual understanding, critical evaluation, and responsible practice.

CS/SCI 173 has been under discussion and development since Summer 2025. In Spring 2026, the course was piloted through the BYTES program in the College of Science as part of a learning-community experience for first-year students. Professor Bejarano has had a central role in shaping the course's structure, learning goals, and instructional direction, and he volunteered to teach its first official offering in Fall 2026, when it is expected to serve approximately 100 students from across the College of Science. Beginning in Spring 2027, the course will be administered directly by the College of Science and taught by other instructional staff, who will rely substantially on the course model, materials, and structure established through Professor Bejarano's development work and initial offering.

C Course Evaluations

1 Student Evaluations

Starting in Fall 2021, the "How would you rate your instructor overall" question was expanded to:

Q1: My instructor seems well-prepared for class.
Q2: My instructor is fair and consistent in evaluating my performance in the course.
Q3: My instructor created a welcoming and inclusive classroom environment.
Q4: My instructor is open to my questions and effectively answers them.

Table 2 gives a summary for course evaluations.

D Other Contributions to CS Education

Undergraduate Research Professor Bejarano has contributed to undergraduate education by creating research opportunities that allow students to engage with topics and methods beyond the standard undergraduate curriculum. These experiences are designed to introduce students to the practices of research in computer science, including reading unfamiliar material, formulating questions, developing and evaluating technical approaches, and communicating results. In this way, his undergraduate mentoring serves both as intellectual enrichment and as an introduction to sustained, open-ended inquiry.

Semester	Course Num.	Course Eval.	Q1	Q2	Q3	Q4	Resp.
FA 2025	CS 176	4.6	4.7	4.3	4.4	4.5	20/29
FA 2025	CS 251	4.5	4.8	4.4	4.6	4.5	20/56
SU 2025	CS 251	4.3	4.7	4.4	4.5	4.5	14/53
SP 2025	CS 251	4.0	4.3	3.7	4.0	4.1	99/289
SP 2025	CS 253	4.5	4.7	4.1	4.4	4.3	29/68
FA 2024	CS 251	4.4	4.6	4.1	4.3	4.3	206/668
SU 2024	CS 251	4.5	4.7	4.3	4.5	4.5	13/48
SP 2024	CS 251	3.8	4.3	3.8	4.1	4.1	91/355
SP 2024	CS 253	4.3	4.5	4.0	4.3	4.4	27/64
FA 2023	CS 177	4.1	4.8	4.3	4.4	4.5	122/335
SU 2023	CS 177	3.2	3.9	3.1	3.3	3.2	13/38
SU 2023	CS 251	4.0	4.1	3.4	3.8	3.5	13/40
SP 2023	CS 177	4.1	4.4	4.1	4.3	4.2	134/347
FA 2022	CS 251	4.6	4.7	4.4	4.6	4.6	184/411
SU 2022	CS 182	4.7	4.7	4.3	4.5	4.5	22/56
SU 2022	CS 251	4.6	4.7	4.3	4.4	4.4	23/54
SP 2022	CS 251	3.8	4.3	3.3	4.0	4.1	156/353
FA 2021	CS 251	4.7	4.8	4.5	4.6	4.7	258/397
SU 2021	CS 182	4.3	4.4	*	*	*	38/97
SU 2021	CS 251	4.7	4.8	*	*	*	27/57
SP 2021	CS 251	4.4	4.3	*	*	*	109/275
FA 2020	CS 251	4.5	4.4	*	*	*	204/361

Table 2: Teaching evaluations for Professor Bejarano at Purdue University since Fall 2020. CS 176, 177, 182, 251, and 253 courses are 3-credit-hour lectures. CS 290-Vibe is an 8-week course offered to students as part of Professor Bejarano's research on AI in CS Education. Professor Bejarano co-taught CS 251 with Federico Cifuentes-Urtubey (Visiting Assistant Professor) in the Fall of 2025, with Jeremiah Blocki (Assistant Professor) in the Fall of 2022, and CS 177 with Jessica Conner-Strunk (Lecturer) during the Summer and Fall of 2023.

* Questions Q2, Q3, and Q4 were not part of the institutional student evaluation during the respective academic terms.

Under his supervision, undergraduate students have participated in projects including Development of Core Skills and Teaching Practices in the Presence of AI (10 students), Automatic Source Code Plagiarism Detection (6 students), Automatic Analysis of Algorithm Runtime (6 students), Shape Modeling with Differential Growth and GenAI (6 students), and Usage of Private GenAI Tools for Course Logistics (4 students).

These efforts have led to several concrete outcomes. Students involved in Automatic Analysis of Algorithm Runtime earned second place in the Presentation category at the Purdue Undergraduate Research Fair in Spring 2023. In Shape Modeling with Differential Growth and GenAI, one undergraduate student became a co-author on the publication titled "Multistep Evolution Method to Generate Topological Interlocking Assemblies." The project Development of Core Skills and Teaching Practices in the Presence of AI also resulted in multiple student co-authorships: three undergraduate students were co-authors of "BoilerTAI: A Platform for Enhancing Instruction Using GenAI in Educational Forums", three were co-authors of "Owlgorithm: Supporting Self-Regulated Learning in Competitive Programming through LLM-Driven Reflection", and two were co-authors of the poster "GLOW: AI-Simulated Students Improve GTA Readiness." These outcomes reflect Professor Bejarano's effort to make undergraduate research a meaningful component of undergraduate education and to support students in reaching the point of public scholarly contribution.

Mentoring and Guiding Undergraduate and Graduate TAs Professor Bejarano has treated the mentoring of undergraduate and graduate teaching assistants as an important component of his contribution to undergraduate education. In his courses, TAs do not function only as logistical support. Rather, they participate in central aspects of the instructional environment, including hosting office hours, leading PSO (practice, study, observe) sessions focused on challenging course questions, responding to student posts in discussion forums, and developing take-home assessments. By involving TAs in these responsibilities, Professor Bejarano views TA work as an instructional apprenticeship in which students begin to confront the practical demands of teaching, communication, and academic support.

A central feature of his mentoring is that he gives TAs meaningful autonomy in how they carry out these responsibilities. His purpose is to allow them to test their own assumptions about teaching against the realities of working with students who are struggling, confused, or unevenly prepared. At the same time, this autonomy is paired with regular guidance and reflection. Professor Bejarano meets with his TAs weekly to discuss how students are engaging with the course, what difficulties are emerging, and what aspects of the course structure or delivery may be affecting the learning experience. These meetings help TAs develop a more realistic, pedagogically grounded understanding of student learning while also providing Professor Bejarano with useful feedback on the course's operation.

His mentoring also emphasizes the distinction between effective support and excessive intervention. In some cases, TAs initially respond to struggling students by providing more help than is instructionally productive. When this occurs, Professor Bejarano works with them to develop strategies that guide students through the underlying reasoning process without removing the productive struggle that is necessary for learning. This aspect of his mentoring reflects a broader teaching philosophy that values conceptual understanding, student accountability, and carefully calibrated support rather than simple task completion.

For more experienced TAs, Professor Bejarano extends these opportunities to include grading responsibilities. In this context, TAs learn how to design and apply grading rubrics and how to read student work carefully and interpret answers with attention to both correctness and intended meaning. He has also given graduate teaching assistants opportunities to lead lectures, enabling them to gain direct experience explaining concepts, managing a classroom, and operating in an instructional role with formal authority. One former GTA who developed through this process later became a teaching professor in the department. Taken together, these practices show Professor Bejarano's commitment to mentoring teaching assistants not only as course support personnel, but as developing educators.

IV ENGAGEMENT AND SERVICE

A Discussion of Service

1 Department

Professor Bejarano's service to the Department of Computer Science has centered on undergraduate education, instructional quality, and the development of teaching capacity within the department. His contributions reflect the same commitments that characterize his teaching and curricular work: careful attention to student learning, thoughtful adaptation to changing conditions in computing education, and sustained investment in the professional development of instructors and teaching assistants. Through committee work, mentoring, faculty review, and participation in departmental events, he has contributed to both the day-to-day operations of the department and its longer-term instructional development.

Since January 2024, Professor Bejarano has served on the Undergraduate Study Committee, where he has contributed to discussions related to the undergraduate curriculum and the student academic experience. Earlier, from August 2022 through December 2023, he served on the Undergraduate AI and DS Committee, participating in departmental efforts to develop and guide undergraduate education in Artificial Intelligence and Data Science. These roles align closely with his broader involvement in course design and curricular adaptation, particularly in areas where computing education must respond to new disciplinary demands and changing student preparation.

Professor Bejarano has also contributed to the department through work focused on instructional review and mentoring. He served as lecturer reviewer for Xiaojin Liu and William Crum from November 2023 through August 2024, and he mentored Jessica Conner-Strunk from June through December 2023. These roles reflect his broader interest in teaching development as a collaborative and reflective process. In keeping with his own approach to course design and instructional revision, he has sought to support colleagues not only through evaluation but also through discussion of pedagogy, course structure, and the practical challenges of helping students develop a durable understanding in computing courses.

His service has also included support for instructional staff and the department's broader teaching mission. Since August 2023, Professor Bejarano has served as a guest speaker at Teaching Assistant Orientation, helping prepare new teaching assistants as they enter instructional roles. This work is consistent with his sustained mentoring of undergraduate and graduate TAs, in which he emphasizes the importance of balancing guidance with student accountability and of understanding teaching as a practice that requires reflection and judgment. In March 2025, he also served as a guest speaker at the Teaching Assistants Session for prospective Ph.D. students, presenting the department's teaching environment and expectations to future graduate students.

In addition, Professor Bejarano has contributed to student-facing and programmatic activities that support departmental community and visibility. He served as Welcome Faculty for the GoBoiler 2024 program in August 2024 and has served as a Sprint Reviewer for the course CS407 - Software Engineering Senior Project since September 2023. Together, these activities reflect a pattern of service that extends across curriculum, instruction, faculty and TA development, and departmental engagement. His service to the department is grounded in a consistent commitment to strengthening undergraduate education and supporting the people who contribute to it.

2 College

Professor Bejarano has played a leadership role in the College of Science's discussions and planning around AI literacy and the instructional implications of GenAI. Drawing on his teaching, curricular experimentation, and research on AI in computer science education, he has contributed to the college's efforts to determine how students in Computer Science, Data Science, Artificial Intelligence, and related fields should be prepared to engage with publicly available GenAI tools. In these discussions, Professor Bejarano has consistently

advocated an approach to AI literacy grounded in critical thinking, algorithmic reasoning, and responsible use, rather than in mere superficial familiarity with AI tools.

Beginning in Spring 2025, Professor Bejarano was invited to participate in college-level discussions on AI literacy, where he helped shape the emerging conversation from a Computer Science perspective. His contributions led to a central role in developing a course proposal to address the College of Science's AI literacy requirement. Working with other faculty in the Department of Computer Science and with colleagues across the college, he contributed not only to the course proposal itself but also to its pedagogical methodology, helping define an approach to AI competency that emphasizes conceptual understanding, reflective judgment, and transparent human-AI collaboration. His role in these discussions positioned him as an active contributor to the college's formalization of this new curricular requirement.

As part of this work, Professor Bejarano was invited to help pilot the course proposal through the BYTES program, the College of Science learning community for first-year students. This experience provided an opportunity to test elements of the course design in practice and to refine its learning goals before broader implementation. After Purdue formally announced the AI Competency requirement in December 2025, Professor Bejarano was asked to take a leading role in developing the course that would satisfy this requirement, building on the prior proposal and the experience gained through the BYTES pilot.

Professor Bejarano will continue this leadership role during Summer 2026 as he prepares the course for its first official offering in Fall 2026. He will teach the inaugural cohort and will also support the College of Science staff who will assume responsibility for the course in subsequent semesters, helping ensure a smooth transition in course delivery and continued fidelity to its educational goals. Taken together, these efforts reflect sustained college-level leadership in developing AI literacy as a new component of undergraduate science education.

3 University

Professor Bejarano's service to the university has focused on the university's institutional response to GenAI and, in particular, on developing a more thoughtful framework for AI literacy in undergraduate education. His contributions in this area have been guided by the same principles that shape his teaching and curricular work: that AI should be addressed as an educational reality, that students should be taught to engage with it critically and responsibly, and that institutional responses should prioritize learning and intellectual development over purely restrictive approaches.

Professor Bejarano was one of the founding members of the AI Advanced Practitioners group, a faculty community formed to discuss more constructive approaches to the use and teaching of AI. The group emerged in part from dissatisfaction with conversations focused primarily on banning AI tools or framing student AI use only as a disciplinary problem. Within this setting, Professor Bejarano contributed perspectives from his work on AI in computer science education and shared insights from his classroom and research. At the same time, participation in the group allowed him to engage with parallel initiatives across campus and to situate his work within a broader university-wide conversation on AI literacy.

In Fall 2026, Professor Bejarano was invited to join the TIGER Team, a university group of selected instructors charged with discussing and proposing new Foundational Learning Outcomes related to AI competency. In this role, he contributed to developing the proposed AI FLOs that would define the new undergraduate expectations in this area. These proposed outcomes were subsequently discussed by the Undergraduate Curriculum Committee of the Faculty Senate and later approved, thereby establishing AI competency as a new requirement for incoming first-year students in the 2026–2027 academic year.

Taken together, these contributions reflect meaningful university-level service at a moment of significant curricular change. Through both the AI Advanced Practitioners group and the TIGER Team, Professor Bejarano has helped shape the university's emerging approach to AI literacy, contributing to the development of policies and learning expectations that will affect undergraduate education across campus.

4 Professional

Professor Bejarano's professional service reflects sustained engagement with the scholarly and educational communities associated with computing education, educational technology, and related interdisciplinary areas. Through conference reviewing, journal reviewing, and judging activities, he has contributed to the evaluation of research, the support of scholarly dissemination, and the broader development of the field. His professional service is closely aligned with his academic work, particularly his interests in computing education, AI in education, student learning, and the evolving relationship between technology and instruction.

A significant portion of this service has involved peer review for journals and conferences. Professor Bejarano has served as a reviewer for journals including Technological Forecasting and Social Change, Social Sciences & Humanities Open, Computers & Education Open, Computers & Education, Thinking Skills and Creativity, Springer Nature Computer Science, and Concurrency and Computation: Practice and Experience. These reviewing activities span topics ranging from computer science and computing practice to education, creativity, and broader social and technological change, reflecting the interdisciplinary scope of his scholarly interests. Through this work, he has contributed to maintaining the quality of published research and to supporting the scholarly communities in which his own work is situated.

Professor Bejarano has also provided professional service through conference reviewing. He has reviewed papers for the 2025 IEEE Global Engineering Education Conference (EDUCON), the 2025 ACM SIGCSE Technical Symposium, the 2024 IEEE Frontiers in Education conference, and the 2020 IEEE Games, Animation, Multimedia, and Multiple Realities conference. In addition, he served as a reviewer for demonstrations at the 2025 ACM SIGCSE Technical Symposium. These activities indicate continued engagement with both disciplinary and educational conference venues, particularly those connected to computing education and pedagogical innovation.

Beyond formal peer review, Professor Bejarano has also contributed as a judge for student-facing academic and technical events, including the Undergraduate Research Fair and BoilerMake X at Purdue University, as well as the ACM Tapia conference poster session. These roles complement his broader commitment to undergraduate education and mentoring by supporting venues in which students present research, design projects, and technical work to broader audiences. Taken together, Professor Bejarano's professional service reflects a consistent effort to contribute to the evaluation, dissemination, and encouragement of scholarly and educational work within and beyond his home institution.

V MENTORING

A Undergraduate Students

Professor Bejarano has made mentoring undergraduate students an important component of his broader contributions to undergraduate education. Through research and development projects, he has created opportunities for students to work on problems not typically encountered in standard coursework and to gain early experience with the practices of inquiry in computer science. These experiences have allowed undergraduates to engage in collaborative technical work, explore unfamiliar concepts and methods, contribute to prototype and tool development, and, in several cases, participate directly in conference papers, publications, and research presentations. His undergraduate mentoring spans projects in computing education, GenAI, software analysis, computational modeling, and algorithmic reasoning, providing students with exposure to both theoretical and applied aspects of the discipline.

Several of these projects produced concrete scholarly outcomes, including undergraduate co-authorship or public presentations. In Development of Core Skills and Teaching Practices in the Presence of AI, Professor Bejarano mentored ten undergraduate and 4+1 students across multiple semesters, including international participants in the GoBoiler program. This project resulted in three separate scholarly outputs involving undergraduate co-authors: three students were co-authors of one paper, two students were co-authors of a second paper, and three students were co-authors of a third paper. In Shape Modeling with Differential Growth and GenAI, one undergraduate student became a co-author of "Multistep Evolution Method to Generate Topological Interlocking Assemblies." In Automatic Analysis of Algorithm Runtime, six undergraduate students collaborated on the development of TRACE (Tool for Runtime Analysis and Complexity Evaluator), presented the work at the Purdue Spring Undergraduate Research Conference in 2024, and earned third place in the College of Science Research Talks category. Professor Bejarano also supervised undergraduates in Automatic Source Code Plagiarism Detection, an ongoing project spanning multiple semesters, and in Usage of Private GenAI Tools for Course Logistics, which examined applications of GenAI in instructional settings.

Taken together, these mentoring activities demonstrate a sustained effort to provide undergraduates with meaningful entry points into research and development work. Rather than limiting students to observational roles, Professor Bejarano has involved them in projects that require technical contribution, reflection, and communication, while also creating pathways toward conference participation, publication, and formal recognition. This record reflects his broader educational commitment to extending undergraduate learning beyond the classroom and helping students begin to participate in the practices of scholarly and professional inquiry.

References

[BDS25] Andres Bejarano, Ethan Dickey, and Rhianna Setsma. Implementing the ai-lab framework: Enhancing introductory programming education for cs majors. In *Proceedings of the 56th ACM Technical Symposium on Computer Science Education V. 2*, SIGCSETS 2025, page 1383–1384, New York, NY, USA, 2025. Association for Computing Machinery. doi:10.1145/3641555.3705201. 3, 8, 9

[BM24] Andres Bejarano and Kathryn Moran. Multistep evolution method to generate topological interlocking assemblies. *Applied Sciences*, 14(15), 2024. URL: https://www.mdpi.com/2076-3417/14/15/6542, doi:10.3390/app14156542. 2, 7, 9

[DB24] Ethan Dickey and Andres Bejarano. Gaide: A framework for using generative ai to assist in course content development. In *2024 IEEE Frontiers in Education Conference (FIE)*, pages 1–9, 2024. doi:10.1109/FIE61694.2024.10893132. 4, 7, 9

[DBG24] Ethan Dickey, Andres Bejarano, and Chirayu Garg. Ai-lab: A framework for introducing generative artificial intelligence tools in computer programming courses. *SN Computer Science*, 5(6):720, July 2024. doi:10.1007/s42979-024-03074-y. 3, 7, 9

[DSS+26] Ethan Dickey, Ashok Saravanan, Alexander Siladie, Houyame Lkhider, Quiondriya Gee, and Andres Bejarano. Glow: Ai-simulated students improve gta readiness. In *Proceedings of the 57th ACM Technical Symposium on Computer Science Education V.2*, SIGCSE TS 2026, page 1291–1292, New York, NY, USA, 2026. Association for Computing Machinery. doi:10.1145/3770761.3777354. 6, 8, 9

[GLDB26] Quiondriya Gee, Houyame Lkhider, Ethan Dickey, and Andres Bejarano. Preparing graduate teaching assistants with structured orientation and ai-simulated students. In *Proceedings of the 57th ACM Technical Symposium on Computer Science Education V.2*, SIGCSE TS 2026, page 1347–1348, New York, NY, USA, 2026. Association for Computing Machinery. doi:10.1145/3770761.3777359. 6, 7, 9

[NCKK+26] Juliana Nieto-Cardenas, Erin Joy Kramer, Peter Kurto, Ethan Dickey, and Andres Bejarano. Owlgorithm: Supporting self-regulated learning in competitive programming through llm-driven reflection. In *Proceedings of the 57th ACM Technical Symposium on Computer Science Education V.1*, SIGCSE TS 2026, page 757–763, New York, NY, USA, 2026. Association for Computing Machinery. doi:10.1145/3770762.3772662. 5, 7, 9

[SGS+24] Anvit Sinha, Shruti Goyal, Zachary Sy, Rhianna Kuperus, Ethan Dickey, and Andres Bejarano. Boilertai: A platform for enhancing instruction using generative ai in educational forums. In *2024 IEEE Frontiers in Education Conference (FIE)*, pages 1–8, 2024. doi:10.1109/FIE61694.2024.10893137. 4, 7, 9