John William Lynch | MS in Computer Science

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PERSONAL SUMMARY:

Computer scientist with diverse work experience, including tutoring and teaching computer science courses at middle-school, high school, undergraduate and graduate college levels, creating large-scale software development projects independently and through coursework, creating websites based on client specifications under an internship and independently, and creating apps for both Android and Apple. Experience with research with a HCI research group at DePaul University and the PhD program in Engineering and Computing Education at the University of Cincinnati. Extremely driven to form new methods of teaching and learning Computer Science for all people, and passionate to help reduce the exclusivity and barriers present in learning and practicing computer science.

SKILLS:

Thorough understanding of Object Oriented Design Patterns, Object Oriented Languages, Algorithm Design & Implementation, and Data Structure Design & Implementations. Excellent interpersonal skills that allow communication of complex computer science topics in a concise and easily understood form. Ability to think critically and solve problems especially when under time constraints. Extremely knowledgeable in Swift, Python, Java, SQL, C, C#, C++, Scala, PHP, JavaScript/JQuery, HTML/CSS. Very adaptable to new coding languages and experienced with exploring and documenting new languages for the creation of tutorials and introductory work. Experienced with research in CS related issues, including but not limited to the Imposter Phenomena, Human Computer Interaction, usage of online-tools in remote educational environments, collaborative learning, instructor evaluation frameworks, and effective online learning practices.

RESEARCH INTERESTS:

Computing Education, Computer Science Notational Machines, Collaborative Technology, Remote Collaborative Learning, Remote Learning, Imposter Phenomenon, and Spatial Visualization in Computer Science. Spatial Skills and relationships to Technical Communication Skills, improvement of technical communication skills in engineering students, and novel ways to examine how Spatial Skills interact with various engineering skills. Passionate to reduce the drop-out rate in Computer Science, improving the accessibility of Computer Science education, and creating new or reinforcing effective methods of teaching and learning Computer Science.

RESEARCH PUBLICATIONS (all papers accessible on personal website):

Initial Investigations into the Link Between Spatial and Technical Communication Skills (2024)

- Primary analysis of spatial skills and technical communication skills in engineering students. Explores how different verbal skills and fluencies interact with spatial skills based on gender and student status (domestic / international).

Developing a Writing Rubric to Answer Research Questions (not for Grading!) (2024)

- Article that discusses the development and application of a rubric to answer research based questions for engineering students and their ability to write.

Exploring The Link Between Spatial And Communication Skills In Engineering Students (2023)

- Exploratory research that examines spatial skills and their relation to various communication tasks in first-year engineering students.

A systematic literature review of educational spatial visualization software and implementations for computing education (2023)

- Systematic literature review that explores different spatial visualization tools in educational contexts and examines the ease of access and ease of use. Publication is aimed to inform the general populace about ways to teach spatial skills in academic contexts.

Work in Progress: Engineering together-Applying remote collaborative technology to an in-person undergraduate engineering course (2023)

- Explores a novel method to teach programming in first-year engineering classes using tools typically applied to asynchronous settings but now applied to in-person formats. Examines the impact this had on teamwork and how in-person screen sharing / pair-programming can be enhanced with new types of technology.

Using Notional Machines to reinforce student comprehension of Lists in Introductory Programming (2020)

- Personal article that discusses the application of notional machines (visual representations of coding concepts) to improve data structure understanding in novice programmers.

RESEARCH EXPERIENCE:

Spatial and Technical Communication Analysis (February 2023-Current)

- Tasked with recording, documentation, and automatic grading of research responses using Python to analyze interview data being collected to explore links between spatial and technical communications.

Quasi-experimental design applying remote technology to in-class first-year engineering course (August 2022 - December 2022)

- Led a research project exploring the application of the remote technology ParSec to in-person engineering courses to research improvements to programming abilities of first-year engineering students. Results to be presented at ASEE 2023 Baltimore conference.

Principal Investigator for Research Group under Dr. Craig Miller (January 2020 - August 2022)

- Tasked with creation, maintenance, and submission of all IRB materials and ensuring funding and research ethics and outcomes were consistent with all IRB guidelines.
- Our team interviewed students taking a remote introductory programming course about efforts to interact with peers for learning the course content. Result is a framework of guidelines for analyzing and refining student collaborative learning. Educators can use this to gauge areas in their lesson plans that need to be refined. Possibility of findings to be published in SIGITE 2022.

EDUCATION:

University of Cincinnati : College of Engineering and Applied Sciences

PhD Student in Engineering Education, expected May 2026

DePaul University : College of Computing and Digital Media

Masters in Computer Science with focus on Software Development, June 2020

DePaul University : College of Computing and Digital Media

Bachelors in Computer Science with focus on Software Development, March 2019

TEACHING EXPERIENCE:

University of Cincinnati : Adjunct Instructor for CS2024C : Data Structures and Algorithms in Python for Non-CS Majors (Spring 2024, Fall 2024):

- Tasked with the development of a curriculum of data structures in python targeted for non-CS majors. Worked with two faculty members in University of Cincinnati to develop, record, and distribute lecturer material

University of Cincinnati : Adjunct Instructor for CS4092: Database Design and Systems (Summer 2024):

- Instructed CS4092, a course for the introduction for junior and senior computer science undergraduates that teaches database design theories and applications using SQL. Helped students develop a working prototype in teams and taught various concepts such as normalization of databases and efficient indexing. Explored other areas of NoSQL and unique applications of databases for students.

University of Cincinnati : Graduate Teaching Assistance for ENED 1100 & ENED 1120 (August 2022 - Summer 2023)

- Tasked with overseeing two or more sections of the first-year engineering course ENED 1100/1120 for two semesters. Class sizes average around 50 students. Responsibilities included managing undergraduate teaching assistants grading, lecturing for Python, MatLab, and LabView topics, communicating students needs to multiple instructors, and overseeing professional development opportunities for students led by undergraduate teaching assistants. Worked with head graduate teaching assistant, program manager, and other graduate teaching assistants to facilitate end of course robotic demonstrations.

DePaul University : Adjunct Instructor (September 2021 - March 2022)

- Instructor for CSC300, a Java-based course where students are introduced to fundamental data-structures in Computer Science. Introduces asymptotic notation, focuses on linear data structures and structures that support disjoint-set operations. Ran course in-person format, created assignments, midterm, final, and supported students via asynchronous and synchronous formats.
- Instructor for CSC242, an intermediate course in problem solving, algorithms and programming using Python. Ran class in synchronous online format. Created labs, assignments, quizzes, and final examinations for the course.
- Instructor for CSC281, a course that introduces students to the Java programming language and eclipse development environment. Developed lectures, tutorial videos, assignments, quizzes, and final examinations. Students emerge aptly prepared for CSC300 upon successful completion of this course.

Northwestern University : CS Curriculum Specialist (September 2021 - March 2022)

- Created a course that used Playgrounds on iPads that introduced adult-learners from various backgrounds who had little exposure to computer science to the Swift programming language. Topics covered included algorithms, logic flow, coding paradigms, problem-solving using computer science, competitive analysis, UX design. Course lasted six weeks and students developed an app to solve a problem they had in their community or personal life. Students presented a showcase of their app that was created with Swift code snippets that had four screens and used algorithms to solve their selected problem. This introductory course helped to promote more understanding of CS and STEM related issues and promote the CECSE mission.
- Tasked with providing support for Chicagoland educators teaching the fundamentals of Computer Science through the Swift programming language. Consistently available for help with creation and implementation of lectures, labs, quizzes, and assignments. Tasked to complete work under tight time-constraints and to be available to provide for a diverse group of educators with various schedules and students.

Illinois Institute of Technology : Adjunct Instructor (May 2021 - August 2021)

- Instructor for Application Development Methodologies (ITMD511) asynchronously to Beacon Education in China through IIT. Developed syllabus and assignments for students to learn the analysis, design, implementation, and maintenance of software in C/Java.

Computer Systems Institute : Adjunct Instructor: (September 2020 - August 2022)

- Adjunct Instructor for the Business Digital Multimedia concentration at Computer Systems Institute. Instructed PhotoShop design courses and HTML/CSS/JavaScript courses. Provided with syllabus templates and tasked with timely grading of course work, ensuring students are attending class, designing extra credit opportunities, and monitoring students' standing with the university.

idTech Online Tutor (July 2020 - November 2020):

- Tutor for one-on-one sessions with young adults and children. Taught students various course-work including game design, web design, and algorithm design using Java, Python, and C/C++.

DePaul University Graduate Assistant (September 2019 - June 2020):

- Teacher's Assistant for Introductory Python Courses 241/242 from Fall 2019 to Spring 2020
    - Tasked with leading labs for an hour and a half for introductory courses in Computer Science using Python. Led both in class labs and online labs during the 2019-2020 school year. Worked with 15-20 students per lab session and needed to balance time, expectations, and examples of code to ensure each student understood and succeeded in their lab. Would monitor each student's comprehension and report to the professor how the direction of the course should be taken based on the students' comprehension. Was successful with helping a professor rework his course layout based on these reports.
- Tutor at College of Computing and Digital Media from Fall 2019 to Spring 2020
    - Tutored both undergraduate and graduate students in all course work provided by DePaul's Computer Science curriculum. This included but was not limited to Object Oriented Programming, Distributed Systems, Data Structures, Web Development, WordPress Development, SQL (statistical analysis tools), recursion in Scala/Python/Java, and all introductory coding courses. Tutoring sessions were half an hour per student and required a shift in the complexity and speed of explanations based on each student's ability.

<u>INDUSTRY EXPERIENCE:</u>

Spatial Visualization Online Learning Management System (May 2023 - Current):

- Sole worker that developed and deployed a scalable learning management system that included spatial visualization modules, information, educational tools, and quizzes. Aimed at young adult students and modeled to ensure efficient dispatch and usage by a myriad of users in different contexts. (https://spatialthinking.netlify.app/)

Covert Nine Web Developer Internship (May 2019 - September 2019):

- Internship in Client-Side web development using WordPress from Spring 2019 to Fall 2019. Tasked with back-end coding for various client websites (Wells-Lamont, RiotFest) using JavaScript, JQuery, and HTML/CSS. Sat in on client meetings with supervisors and understood how to transfer client requests towards code. Monitored and maintained previously created websites and was tasked with creating a full test report for Covert Nine's new block system they were deploying that summer.

NorthEastern University Gear UP Assistant(April 2019 - June 2019):

- Assistant Tutor for SENN High School in Chicago, IL. Tutored for introductory highschool MIT SCRATCH programs, tutored in mathematics and natural sciences, and aided with college enrichment programs for senior highschool students.

DePaul University College Connect Peer Guide (June 2018 - August 2018):

- Peer Guide for Introductory Website Development Course using WordPress. Tutored Sophomore, Junior, and Senior highschool students in creating personal blogs using WordPress. Also tutored students in introductory PHP coding and introduced variables, basic control loops and for-loop iteration methods.Worked under supervision of Professor Michael Chase.

DePaul University Senior Capstone (June 2018):

- Worked with four other senior computer science students to implement a mock LinkedIn website *Skillmatic* that maps current course work to respective jobs. Used a combination of Ruby on Rails, Jquery, Javascript, HTML/CSS.

FELLOWSHIPS, MEMBERSHIPS & HONORS:

University of Cincinnati: Department of Engineering Education Graduate Student Association President (Fall 2024 - Current):

- President for the graduate student association of the Department of Engineering and Computing Education. Oversaw events and applied for funding that allowed guest speakers from different universities and industry to visit in-person seminars to present research and allow graduate students and faculty to network. Tasked with attendance of monthly meetings to ensure sufficient funding and voted on various policies, including funding for graduate students, conference travel awards,

University of Cincinnati: ASEE Student Chapter President (Fall 2024 - Current):

- President of the American Society for Engineering Education (ASEE) Student Chapter, which aimed to recruit more undergraduate and graduate students into engineering education domains. Attended yearly conference meetings to discuss what current students feel about the current climate of engineering education and unique ways to improve outreach to new members.

Stanford University: Section lead for CodeInPlace (April 2021 - May 2021):

- Volunteer section lead for Stanford's Department of Engineering. Instructed students on advanced programming concepts using Python in association with Karel IDE. Ensured students were up-to-date on each lesson and hosted supplementary office hours for students to explore new avenues and related code in C and Java.

Persevere Now : Code Mentor (April 2021 - May 2021):

- Code mentor for students in Persevere Now, a non-profit focused on the education of incarcerated individuals to train them to become full-stack web developers. Provided one-on-one guidance with incarcerated individuals and led one-hour meetings, where I provided groups of incarcerated individuals examples of programming projects and what they can accomplish with their education.

Northwestern University:

- **Center for Excellence in Computer Science Education Fellow (Feb. 2021 - Dec. 2021):**
    - Fellowship given to select Computer Science educators in the Chicago-land area. Tasked with learning the *Swift* coding language before engaging with partnered members to develop and implement a *Swift* course geared towards Chicago-land youth and highschoolers.

DePaul University : College of Computing and Digital Media

- **DePaul University DePaul Admission Partnership Program Scholar**
    - Program provided scholarships and facilitated the transfer process from community college to DePaul.
- **DePaul University Computer Science Society Member**
    - Engaged with various presenters and DePaul peers to speak about Computer Science topics and industry opportunities.

Wilbur Wright Community College

- Inducted into Phi Theta Kappa Society as a Scholar in 2017
- Environmental Club Member that led presentations and organized events to promote environmental issues and solutions.

Notre Dame College Prep

- National Society of High School Scholars Member for 2016