

# ZACHARY EBERHART

108 N. Main St., #705  
South Bend, IN, 46601  
719-377-1571  
zacharyeberhart@nd.edu

254 Fitzpatrick Hall  
Notre Dame, IN, 46556  
zeberhar@nd.edu

## EDUCATION

---

- Ph.D.** | University of Notre Dame | Notre Dame, IN *Spring 2023 (Expected)*  
Computer Science and Engineering  
Thesis Title: Enabling Dialogue Systems for On-Demand Software Documentation  
Advisor: Collin McMillan, Ph.D.  
Committee: Jane Cleland-Huang, Ph.D., Ron Metoyer, Ph.D., Reid Holmes, Ph.D.
- M.S.** | University of Notre Dame | Notre Dame, IN *Spring 2021*  
Computer Science and Engineering
- B.A.** | Colorado College | Colorado Springs, CO *Spring 2017*  
Major in Chemistry, Minor in Computer Science, *cum laude*

## RESEARCH EXPERIENCE

---

My research focuses on the application of **natural language processing** to **software engineering tasks**, including **conversational API search**, **source code summarization**, and **virtual assistants** for developers.

---

- Department of Computer Science and Eng.** | University of Notre Dame | Notre Dame, IN *2017 - Present*  
Doctoral thesis research conducted with Dr. Collin McMillan
- Authored 3 and contributed to 8 research papers published by IEEE/ACM conferences and journals
  - Performed a Wizard-of-Oz study simulating virtual assistants for programmers
  - Developed a clarification question generation method for source code search
  - Created a dialogue system for conversational software search using reinforcement and unsupervised learning
  - Designed 5 web interfaces for user studies with Ruby on Rails, React, and Flask
- Department of Chemistry and Biochemistry** | Colorado College | Colorado Springs, CO *2017*  
Undergraduate capstone thesis research conducted with Dr. Sally Meyer
- Created a diffusion quantum Monte Carlo simulator to solve the Schrödinger equation for 1-D systems

## TEACHING EXPERIENCE

---

- Teaching Assistant** | University of Notre Dame | Notre Dame, IN *Spring 2021*  
Course: Dialogue Systems (undergraduate), taught by Dr. Collin McMillan
- Student Mentor** | Illinois School for the Visually Impaired | Jacksonville, IL *Fall 2018*  
Mentored high school seniors on semester-long CS projects using accessibility-oriented technology

**Teaching Assistant** | University of Notre Dame | Notre Dame, IN  
Course: Data Structures (undergraduate), taught by Dr. Dhreya Kumar

*Spring 2018*

**Teaching Assistant** | University of Notre Dame | Notre Dame, IN  
Course: Database Concepts (undergraduate), taught by Dr. Tim Weninger

*Fall 2017*

**Teaching Assistant** | Colorado College | Colorado Springs, CO  
Course: Computer Organization (undergraduate), taught by Dr. Ben Ylvisaker

*Spring 2016*

---

## REFEREED PUBLICATIONS

---

### JOURNAL ARTICLES:

**Eberhart, Zachary**, Aakash Bansal, and Collin McMillan. "A Wizard of Oz Study Simulating API Usage Dialogues with a Virtual Assistant." IEEE Transactions on Software Engineering, Accepted. (2020).

### CONFERENCE PROCEEDINGS:

**Eberhart, Zachary**, and Collin McMillan. "Dialogue Management for Interactive API Search." In 2021 IEEE International Conference on Software Maintenance and Evolution (ICSME), Prepublication. IEEE, 2021.

Bansal, Aakash, **Zachary Eberhart**, Lingfei Wu, and Collin McMillan. "A Neural Question Answering System for Basic Questions about Subroutines." In 2021 IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER), pp. 60-71. IEEE, 2021.

Wood, Andrew, **Zachary Eberhart**, and Collin McMillan. "Dialogue Act Classification for Virtual Agents for Software Engineers during Debugging." In Proceedings of the IEEE/ACM 42nd International Conference on Software Engineering Workshops, pp. 462-469. 2020.

Stapleton, Sean, Yashmeet Gambhir, Alexander LeClair, **Zachary Eberhart**, Westley Weimer, Kevin Leach, and Yu Huang. "A human study of comprehension and code summarization." In Proceedings of the 28th International Conference on Program Comprehension, pp. 2-13. 2020.

**Eberhart, Zachary**, Alexander LeClair, and Collin McMillan. "Automatically extracting subroutine summary descriptions from unstructured comments." In 2020 IEEE 27th International Conference on Software Analysis, Evolution and Reengineering (SANER), pp. 35-46. IEEE, 2020.

Wang, Daheng, Meng Jiang, Qingkai Zeng, **Zachary Eberhart**, and Nitesh V. Chawla. "Multi-type itemset embedding for learning behavior success." In Proceedings of the 24th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining, pp. 2397-2406. 2018.

LeClair, Alexander, **Zachary Eberhart**, and Collin McMillan. "Adapting neural text classification for improved software categorization." In 2018 IEEE International Conference on Software Maintenance and Evolution (ICSME), pp. 461-472. IEEE, 2018.

## PRESENTATIONS

---

### RESEARCH TALKS – EXTERNAL:

**Int. Conference on Software Maintenance and Evolution** | Luxembourg City (Virtual) *September 2021*  
 Title: Dialogue Management for Interactive API Search

**Int. Workshop on Realizing Artificial Intelligence Synergies in S.E.** | Seoul (Virtual) *July 2020*  
 Title: Dialogue Act Classification for Virtual Agents for Software Engineers during Debugging

**Int. Conference on Software Analysis, Evolution and Reengineering** | London, Ontario *February 2020*  
 Title: Automatically Extracting Subroutine Summary Descriptions from Unstructured Comments

**Int. Conference on Software Analysis, Evolution and Reengineering** | London, Ontario *February 2020*  
 Title: Enhancing Source Code Refactoring Detection with Explanations from Commit Messages  
*(Presented on behalf of Rreza Krasniqi and Dr. Jane Cleland-Huang)*

### RESEARCH TALKS – INTERNAL:

**Notre Dame Natural Language Plus Working Group** | Notre Dame, IN *October 2021*  
 Title: Dialogue Management for Interactive API Search

**Notre Dame CSE Seminar Series** | Notre Dame, IN *September 2021*  
 Title: Dialogue Systems for On-Demand Software Documentation

## UNIVERSITY SERVICE

---

**Graduate Student Government** | University of Notre Dame | Notre Dame, IN *2020-Present*  
 Social Committee Chair

- Organized monthly social events with an annual \$10,000 budget

**Graduate Student Orientation Committee** | University of Notre Dame | Notre Dame, IN *2021*  
 Committee Member

**Society of Schmitt Fellows** | University of Notre Dame | Notre Dame, IN *2017-Present*  
 Committee Member

## HONORS AND AWARDS

---

**Arthur J. Schmitt Leadership Fellowship in Science and Engineering** | Univ. of Notre Dame *2017-Present*  
 Full tuition scholarship and annual \$35,000 stipend awarded to 7 of 113 CS Graduate Students

**Dean's List** | Colorado College *2016-2017*  
 Honor awarded to students with a minimum GPA of 3.75

## OTHER PROFESSIONAL EXPERIENCE

---

**IT Technician** | Colorado Hi-Tech Solutions | Colorado Springs, CO

2014-2017

- Performed data entry, reception, and technical support
- Transported and set up medical office workstations

## CREATIVE WORKS

---

**Ghost in the Cell** | [GhostInTheCell.io](https://ghostinthecell.io)

2020

A cooperative deduction game for the web written in Javascript and Python

**TSŪKU** | [Google Play Store](https://play.google.com/store/apps/details?id=com.tsuku)

2019

An abstract strategy game for Android devices developed with React Native

- >1000 downloads on Google Play

**Mystery Wizard!?** | [GMT Games](https://gmtgames.com)

*Funded in 2019*

An asymmetrical strategy board game about spell slingers and sand witches

- Currently in development at GMT Games with >500 preorders