

# Zyad Yasser

📍 Abu Dhabi, UAE    ✉ contact@zyadyasser.com    ☎ 054 599 1445    🌐 zyadyasser.com    📷 zyasserd  
in zyad-yasser    📞 0009-0004-8469-8318

## Education

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**New York University Abu Dhabi (NYUAD)** Abu Dhabi, UAE  
*BS in Computer Science and Mathematics (Double Major)* Aug 2019 – May 2023

- **Grade:** Graduated *summa cum laude* (with highest honors), GPA: 4.0/4.0.
- **Relevant Coursework:** Computer Security, Theory of Computation, Machine Learning, Operating Systems, Algorithms, Data Structures, Number Theory, Abstract Algebra II, Linear Algebra

**Salah El Deen Official Language School** El Mahalah, Egypt  
*High School in Mathematics Section* July 2019

- Valedictorian of the mathematics section
- Ranked **#1** at the school level; Ranked 90th/118,071 (**99.9+** percentile) nationally

## Experience

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**Center for Quantum and Topological Systems, NYUAD** Abu Dhabi, UAE  
*Research Assistant* Dec 2023 – present

- Continued and expanded research on the formalization of higher Schreier theory, culminating in co-authoring a paper that was accepted in the Journal of Symbolic Logic.
- Formalized mathematical frameworks for braid groups in the context of topological quantum computing.
- Provided guidance and mentorship to undergraduate students participating in the 2024 summer research program, assisting with projects related to Homotopy Type Theory and formal proof using *Cubical Agda*.
- Expanded the center's guide to *Cubical Agda*, contributing to community resources and improving the onboarding process for new students researchers.
- Developed a Docker image for *Cubical Agda*, simplifying the setup process for new users and ensuring reproducible research environments. This facilitated collaboration within the research group and streamlined the onboarding of new students.

**COMPSEC Lab, EPFL (École Polytechnique Fédérale de Lausanne)** Lausanne, Switzerland  
*Research Intern* Aug 2023 – Oct 2023

- Participated in the Summer@EPFL program, an exceptionally selective internship (**1.5%** acceptance rate), offering a rare opportunity to engage in cutting-edge research.
- Gained hands-on experience in advanced cryptographic concepts, including interactive proofs, succinct arguments, polynomial commitments, zero-knowledge proofs, and their applications in cryptography and complexity theory,
- Conducted research on tightening security bounds for the BCS construction using techniques from the paper *Tight Security Bounds for Micali's SNARGs*.

**Center for Quantum and Topological Systems, NYUAD** Abu Dhabi, UAE  
*Student Researcher* Feb 2023 – July 2023

- Acquired expertise in Homotopy Type Theory and Martin-Löf Type Theory, while gaining proficiency in using Agda for formal proof verification.
- Applied the acquired knowledge to contribute to the formalization of topological quantum computers, supporting ongoing research projects.
- Participated in a summer research school on advanced Homotopy Type Theory, mastering *Cubical Agda*, an extension of Agda.
- Conducted research on formalizing higher Schreier theory using *Cubical Agda*, contributing novel insights to the field.

## Egyptian Mathematics Olympiad

*Coach & Deputy Team Leader*

*Egypt*

*Nov 2022 – June 2023*

- Conducted online courses on algebra, geometry, number theory, and combinatorics.
- Organized rigorous filtration exams and team selection tests, resulting in the selection of 6 exceptional students from hundreds of applicants.
- Implemented a structured training program, providing students with weekly assignments and individualized feedback to enhance their problem-solving skills.
- Mentored and trained students, providing weekly assignments and personalized feedback.

## Unix Lab, NYUAD

*Monitor and Learning Assistant*

*Abu Dhabi, UAE*

*Sept 2022 – May 2023*

- Facilitated the learning of students in various computer science, programming, and mathematics courses.
- Provided personalized one-on-one instruction and support to over 250 students across 9 different courses, aiding in their understanding of complex concepts and assignments.
- Led 5+ workshops focused on preparing students for technical interviews, equipping them with valuable skills and confidence for future career opportunities.

## Senior Year Capstone Project, NYUAD

*Student Researcher*

*Abu Dhabi, UAE*

*Apr 2022 – May 2023*

- Developed a federated fog computing architecture to enhance QoS in IoT applications, addressing network delays and privacy concerns.
- Implemented a decentralized evolutionary game-theoretic algorithm to stabilize the fog federations' formation.
- Designed a federated learning model for QoS prediction with **90%+** accuracy, maintaining data privacy.
- Conducted additional research post-graduation, leading to two published papers in IEEE journals and conferences.

## Courant Institute of Mathematical Sciences, NYU

*Student Researcher*

*New York, USA*

*June 2022 – Oct 2022*

- Assisted Professor *Richard Cole* in his project *Stable Matching: Choosing Which Proposals to Make* to find experimental limitations on the preference lists size of the deferred acceptance algorithm.
- Developed a probabilistic simulation to check the results experimentally that is a **90%+** improvement in efficiency over the previous tools. That allowed the team to reach data that was previously unattainable.

## Algorithmic Problem Solving Club, NYUAD

*Lecturer, President, Treasurer*

*Abu Dhabi, UAE*

*Nov 2019 – May 2022*

- Led the university's team selection tests for the ACM Arab Collegiate Programming Contest (ACPC), administering qualifying exams to select top-performing students.
- Led and delivered weekly problem-solving sessions.
- Managed the club's finances as Treasurer, ensuring responsible allocation of funds for events, workshops, and travel to competitions.

## Projects

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### ClassOf AI | [classof.ai](https://classof.ai)

*Mar 2024*

- Developed an LLM-powered college counseling tool leveraging Retrieval-Augmented Generation (RAG), vector search, and real-time web search.
- Implemented technologies including LangChain, LlamaIndex, Pinecone, and SerpAPI to launch the product to over 300 waitlisted users within 3 weeks.
- Ranked in the Top 10% of all applications for Y Combinator's Summer 2024 batch.

### Iqaa | [github](https://github.com)

*Jan 2022 – Apr 2022*

- Designed a simple textual format to describe and store Arab music rhythms (iqaa) to make it simpler for musicians to preserve this highly undocumented heritage.
- Developed a tool that modifies this format and transforms it into and from audio.

## ProjectA | [github](#)

June 2021 – Aug 2021

- Developed a Turing-complete domain-specific language (DSL) for describing abstract automata, simplifying the process of defining and analyzing automata.
- Built an interpreter for the created DSL in Haskell, providing an interactive tool to explore and understand automata theory concepts.

## Grocery on Rails | [github](#)

Apr 2021

- Developed a cross-platform eGrocery mobile app using *Flutter*, integrating a *Flask RESTful* API and *MongoDB* database for backend functionality.
- Collaborated with a team of 3 using *Agile* methodologies to deliver the project within a defined timeframe.

## Veritas | [github](#)

June 2020

- Developed a Chrome extension that analyzes news articles to identify bias and suggests alternative coverage from outlets with differing political perspectives.
- Leveraged MonkeyLearn's natural language processing API and the Google Search API for backend functionality.
- Accepted to Mozilla Builders Open Lab 2020.

## Publications

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### Higher Schreier Theory in Cubical Agda

Mar 2025


David Jaz Myers, Ziad Yasser

[10.1017/jsl.2024.78](https://doi.org/10.1017/jsl.2024.78)  (Journal of Symbolic Logic – JSL)

### Federated Learning and Evolutionary Game Model for Fog Federation Formation

Oct 2024

Z. Yasser, A. Hammoud, A. Mourad, H. Otrok, Z. Dziong, M. Guizani

[10.1109/JIOT.2024.3484357](https://doi.org/10.1109/JIOT.2024.3484357)  (IEEE Internet of Things Journal)

### Towards Stable Federated Fog Formation Using Federated Learning and Evolutionary Game Theory

Dec 2023

Z. Yasser, A. Hammoud, A. Mourad, H. Otrok, Z. Dziong, M. Guizani

[10.1109/GLOBECOM54140.2023.10437683](https://doi.org/10.1109/GLOBECOM54140.2023.10437683)  (2023 IEEE Global Communications Conference – Globecom)

## Awards

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- Awarded a 10-year golden residency by the UAE government under the *outstanding university student* category in Jan 2024, recognizing exceptional academic achievement.
- NYU Founders Day Award in Apr 2023
- NYUAD Undergraduate Summer Research Scholarship in May 2022
- Third Price in the International Mathematics Competition in Aug 2021
- 1st National Level (UAE) in the Google Hash Code Competition in Nov 2019
- 4th National Level (Egypt) in the Egyptian Mathematical Olympiad in Mar 2019

## Skills

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**Programming Languages:** Python, C#, Scala, Haskell, Agda, C, C++, LaTeX, Mathematica, Assembly

**Web Development:** JavaScript, Flutter, HTML/CSS, TailwindCSS, Svelte, Node.js

**DevOps:** Docker, Nix, GitHub Actions

**Research & Methodologies:** Genetic Algorithms, Federated Learning, Cloud Federation, Fog Federation, Fog Computing, Evolutionary Game Theory, Nash Equilibrium

**Languages:** Arabic (native), English (proficient), German (beginner), Romanian (beginner)