

# Guruprerana Shabadi

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## Introduction

I am a third year bachelor student at École Polytechnique studying mathematics and computer science. My current research interest lies in formal methods for cyber-physical systems (CPS), a topic I am actively thinking about and working on. I am fascinated by the topic of safety in cyber-physical social systems (CPSS) which involve complex interactions between multiple autonomous systems, humans, and the environment. I hope to work in this area during my graduate studies. I am also interested in formal verification of controller components trained with machine learning algorithms, which is what I will be working on starting from January 2022.

## Education

- **École Polytechnique** Palaiseau, France  
*B.S., Mathematics and Computer Science (Cumulative GPA: 4.21/4.0) Sep. 2019 - Present*
  - Admitted into the program with honors
  - Relevant courses: Design and Analysis of Algorithms, Machine Learning, Formal Languages, Computer Architecture, Compilers, Functional Programming, Mathematical Modelling, Group Theory, Measure Theory, Topology and Differential Calculus, Numerical Linear Algebra
- **Sindhi High School** Bengaluru, India  
*High School Diploma (Aggregate: 95.6%) Jun. 2017 - Apr. 2019*
  - Subjects: Mathematics, Physics, Chemistry, and Biology

## Experience

- **Department of Computer Science, École Polytechnique (LIX)** Palaiseau, France  
*Summer Research Intern Jun. 2021 - Present*
  - Advisor: Prof. Sergio Mover
  - Working with the Cosynus team on accounting for communication delays arising in cyber-physical systems
- **Fasfox** Paris, France  
*Software Developer Intern Jun. 2020 - Aug. 2020*
  - Worked on the development of an application called 'Concrete Dispatch' used by large scale construction sites. Involved in all aspects of development including frontend and backend.
  - Technologies used: Django, Vue.js, Android

## Awards

Excellence Scholarship from the École Polytechnique Foundation	2019-2022
DGA Scholarship from the French Directorate General of Armaments	2021-2022

## Projects

- **FlapAI**  
*Machine Learning Project, CSE204*
  - Implemented neuroevolution and Q-Learning algorithms from scratch to learn how to play the game of Flappy Bird
- **Nuit de l'IA Hackathon**  
*Organized by Binet AI and X-UP Start-up Accelerator at Ecole Polytechnique* *Sep. 2019*
  - Member of the winning team at the hackathon
  - Best implementation of a multilabel classification algorithm for supermarket products
- **Other Projects**  
*École Polytechnique*
  - Built an online platform on Django for all the students to be able to track purchases and subscriptions made on campus.

## Skills

**Languages:** C/C++, Python, Haskell, JavaScript, Java, HTML-CSS, Coq, x86 Assembly

**Frameworks:** Django, Vue.js, Android, React, React Native, Pandas, Scikit-learn, Tensorflow, Qt

## Volunteer Experience

- **Developer Student Club of École Polytechnique**  
*Developer Student Club Lead* *Sep. 2020 - Jun. 2021*
  - As a part of the Google DSC Program, led a team in organizing events, workshops, and competitions about various platforms and technologies, including cloud and AI.
- **Student Body of École Polytechnique**  
*Chief Financial Officer* *Jun. 2020 - Jun. 2021*
  - I was incharge of accounting, and gathering of sponsorships and funds, in addition to organizing the social and cultural life on campus.