

My interest in Computer Science and Mathematics stems from my enjoyment of challenging problems - be it solving difficult puzzles, analysing mathematical structures or designing complex systems. I find it satisfying to really understand how simple things add up to create something truly intricate - to me, this beauty is what connects CS and Mathematics.

Since the age of 6 I have spent a huge part of my out-of-school time learning computer science and software engineering on my own. This interest started with Lego Mindstorms robotics, which helped me understand the basics of programming and build various contraptions, including a working pinball machine. Later I used C++ to create hobby projects such as a Hangman game, a Sudoku solver, and an AI for the game Gomoku which almost always beat human players. With my friends, we built a game for Android, using the book "Beginning Android Games" by Mario Zechner as our guide. The scope of this project was much bigger than anything we had done before, so it helped me learn a lot about software architecture - the components that I created later turned out much more robust. We uploaded our game, "Elude", to the Google Play Store. Since then, I have started working on a new one - this time a simple real-time strategy, as I am interested in the challenge of writing an AI for that.

I have performed very well in various algorithmic programming contests - my greatest results so far are the two silver medals I earned this year at the Central European Olympiad in Informatics (CEOI) and the International Olympiad in Informatics (IOI). This was made possible through several years' hard work: I was first invited to the qualifier competition for the CEOI in 2014 thanks to my results at a national competition, and in 2015 I was given the opportunity to take part in the IOI qualifier as well - a year earlier than most of my peers. I did not qualify yet, but these contests motivated me greatly: I started to take part in online competitions on sites like CodeForces and CSAcademy regularly, and my results steadily improved. I participated in the 2016 Google Code Jam, ranking 895th out of more than 27,000 competitors. All this practice paid off: I solved all tasks at the 2016 Olympiad qualifier perfectly, receiving the highest possible score. I qualified for both Olympiads and received two silver medals.

I have been interested in mathematics for a long time as well - I have taken part in competitions every year since I was about 8 years old. I usually rank ~20th-25th among students of my age - for example, this spring I was 21st at the National Olympiad (OKTV). I also take part in special weekend mathematics camps with the top 30 students of my year organized by the famous mathematician and teacher Lajos Pósa.

Early this year, as a school project, I analysed certain properties of the structure of Wikipedia. My main goal was to show, without using data about the topics of each page, that there is structure to where the first link on each page leads, since it's usually to a page for a more general topic. This involved downloading the encyclopedia in several languages in text form, parsing it for links between the pages, computing statistics about the arising graph and inspecting this in R, a statistical computing framework. I wrote over 20 pages about my results, successfully showing some interesting patterns in the data.

I spend a large portion of my free time working as a member of a volunteer organization at school - we organize activities for younger students, including a summer camp. I am also interested in unconventional video games, particularly those exploring what a game even is, and how games can relate to art.

Given my experience, I am confident that the field of Computer Science matches my interests and abilities perfectly. I am looking forward to the chance to study it at a very high level in a stimulating environment, and meet similarly motivated people from all around the world.