Miguel Young de la Sota

(787) 548-0156 • mcyoung@mit.edu • 555 W. Madison St., Chicago, IL 60661

Education

2014–2018 **Bachelor's of Science in Pure Mathematics**, *Massachusetts Institute of Technology*
Coursework in many areas of pure mathematics, with a particular focus on topology. Subjects included complex analysis, representation theory, algebraic topology, specialized courses in gamma functions and the one-element field, and the graduate topology seminar.
Cumulative GPA: 4.6/5.0

Experience

2018– **Software Engineer**, *Google*

2016–2017 **Undergraduate Researcher**, *MIT Mathematics Department*
Worked with Professor Clark Barwick, who primarily studies higher category theory and related topics in topology and algebraic geometry.
As an undergraduate researcher, studied the critical group of a simplicial set (originally a combinatorial invariant), which may express minimality properties of simplicial sets.

2016–2017 **Software Team Member**, *Harvard–MIT Mathematics Tournament*
HMMT, the Harvard–MIT Mathematics Tournament, is a mathematics olympiad for high-school students from around the world. Hundreds of teams attend each year. HMMT's custom software handles schedules and scores on tournament day.
As part of the Software Team, built an Android application (with Kotlin) to provide teams with personalized schedules, directions, and notifications on tournament day. Designed the REST API used by the Android application (and its iOS counterpart) to communicate with the HMMT servers.

2013–2016 **Lead Developer**, *Octagami's Omniverse*
Octagami's Omniverse is a customized *Minecraft* server offering an MMORPG-like experience. Serving 500 active players at peak and surpassing a quarter million unique users, Omniverse uses a distributed backend to overcome performance bottlenecks that would normally hold back capacity.
As Lead Developer, designed distributed architecture (with Java) using existing proxy technology. Also worked with a team to design scalable gameplay features leveraging this architecture.
Major achievements:

- Remote method invocation infrastructure built on the message passing facilities of the proxy.
- Real-time *Minecraft* packet editing for fine-grained control of client–server communication.
- JVM performance tuning, including memory utilization optimization and JIT tuning.

Skills

Fluent in Java, Scala, Kotlin, and JVM assembly. Extensive background working with the HotSpot JVM. Also proficient in Rust, Python, the Bash and Zsh shells, LaTeX typesetting, and Mathematica. Exposure to C, C++, Haskell, Go, and Perl. Working knowledge of web technologies. Experience with IntelliJ IDEA, Git, Vim, and Linux server administration.

Activities

SIPB **The Student Information Processing Board** is MIT's volunteer computing group, providing both computing services and technology advocacy to the MIT community.

- Chair (2017–2018). Led regular meetings, acted as a spokesman for SIPB, and set SIPB's long-term vision: modernizing our services for the cloud.
- Organized the Hyades Project, a cluster management system for use by the MIT community. Hyades is a fully unified, on-premises cloud container host.
- Represented students in discussions on NextGen MITnet, MIT's network infrastructure upgrade and IPv6 deployment project.

Spigot **Spigot** is an open-source, high-performance fork of the official *Minecraft* server implementation, developed to improve scalability beyond 70 active players.
Contributed significant patches to Spigot's plugin API, substantially improving API coverage.