Alexander K. **Alema**

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"Hard work beats talent every time."

Application Team

February 14, 2024

Massachusetts Institute of Technology
Cambridge MA 02139-4307

Subject: Application for SGI Program - Passion for Geometry Processing

Dear Admissions Committee,
I am writing to express my sincere interest in the SGI program. As an aspiring computer science student, I am captivated by the fields of mathematics, algorithms, and visual computing. Allow me to share my journey and why I believe this program is the perfect fit for me.

High School Journey

During my high school years, I was fortunate to receive a full scholarship to attend Kotebe Metropolitan University Science shared campus, renowned for its rigorous academic environment, I had the privilege of learning alongside selected top-notch students from all schools in Addis Ababa. The intellectually stimulating environment fueled my passion for science and mathematics, leading me to embrace challenging problem-solving tasks.

Academic Achievements

Collaborating with exceptional students pushed me academically, and in my 10th grade Ethiopian national Examination, I not only obtained straight A's but also ranked 95th nationwide, representing 10 students from my school in the top 100 list. The highest math score was mine as well (97/100). Furthermore, I achieved an outstanding score of 621 in Ethiopia's university entrance examination, placing me among few students who attained such remarkable results. These achievements highlight my deep interest in education growing up and the value I place on hard work.

The Dilemma

Like many students, I faced a critical decision when considering which university path to pursue. Initially and intuitively, I was determined to pursue a mathematics degree, but discouraging narratives surrounded me. A fellow graduate from Addis Ababa University shared his challenging experience as a math major, describing it as the "worst years of their life." Additionally, concerns were echoed by my family regarding limited prospects for mathematics graduates in our country.
However, amidst this uncertainty, my uncle pointed me to the field of computer science, highlighting its strong connection to mathematics and its emphasis on problem-solving. He explained how computer science encompasses concepts such as algorithms, data structures, and computational geometry, which truly intrigued me. Inspired by his insights, I decided to embark on a new journey, one that would enable me to combine my passion for mathematics with the practical applications and problem-solving opportunities offered by computer science. This ultimately reshaped my university path and ignited a newfound excitement within me.

Embracing Computer Science

As I pursued my computer science degree, my interest grew exponentially as connections emerged between diverse topics. Concepts from calculus, geometry and discrete math came alive through computer science applications. I loved combining theoretical and practical knowledge to address challenges. Collaborating with peers on projects broadened our collective insights.Through coursework covering algorithms, data structures, programming paradigms and more, I gained a deeper understanding of computational problem-solving. Coding allowed me to conceptualize solutions in a hands-on, creative way. I enjoyed the process of

breaking down complex problems, designing optimized logic, and bringing ideas to life through programming. Tackling assignments and projects gave me flexibility to explore new approaches. I found satisfaction in debugging until programs functioned precisely as intended.

Projects

Personal Projects

- **Note-Taking App:** This was my initial venture into Flutter, allowing me to familiarize myself with the language and its capabilities. It allowed basic note creation, editing and organization with different languages options existing in my country,
- **Property Tracking App for Local Church:** My first foray into real-world problem-solving, this app was developed to assist the local church in managing property records (withdrawal request and approval for church).
- **Gym Management App:** Collaborative class project that streamlines gym operations and customer interactions.
- **Class Assignments:**I take time and care when working on my assignments. You can see some samples here at My Drive.

Internships

- **Tool App Development at Internsavvy:** During my internship at Intersaavy, I honed my skills in clean coding practices, including the implementation of a childhood local game. This experience underscored the importance of collaboration and learning from industry experts.
- **Smart City App Development at Dinobit:** My tenure at Dinobit was my first collaboration with field experts to assist in the development of a map-based public utility tracking platform, strengthening my skills in working with other developers. This project helped in my growth as a developer and my ability to contribute meaningfully to large-scale initiatives.

Production Applications

- **Selam:** Hired to develop Selam, a nationally recognized app offering a platform for creators to share and monetize their content. From Figma design to launch, I solely led the mobile app development, collaborating with two backend developers and working on the project for nearly three months. The app is now live and actively maintained.
- **Ethrons:** Contributed as mobile developer to a reading platform connecting authors and readers. Although my involvement ended prematurely upon returning to school, my contributions laid major groundwork and is expected to be realized soon.
- **Cafe System for Ministry of Innovation and Technology of Ethiopia:** I led a team of four students in the development of the Ministry's cafe system, which is on the verge of deployment. We were responsible for building the mobile app used by employees, developing the admin, cafe committee, cafe manager, and storekeeper interfaces using React, and creating APIs with Laravel. We have also included a desktop app version for the mobile app for those employees(users) without smart phones, to order using the computers that the ministry provides them. This project represents my largest project undertaking to date.

Why SGI ?

Joining the SGI program would be transformative for me. The concept of geometry processing intrigues me— The idea of transforming abstract mathematical concepts into tangible, applied solutions captures my imagination. I am eager to learn from the top researchers who will be sharing their work. Their presentations will help me better understand the variety of career opportunities available. I also look forward to collaborating with other talented students and program staff. This, I think, for me will have potential for lasting professional networks.

Most importantly, SGI provides the nurturing environment that I need to significantly boost my learning. Having experts guide my studies will accelerate my grasp of complex topics. I will benefit from exploring my interests through research and course work. Working with teammates to solve problems will help me further strengthen my skills that I need for my carrer path.

I don't see SGI as just a program; It is a chance to live out my academic passion I once had in highschool. SGI would offer a rare glimpse into what pursuing mathematics as a career may have looked like for me. It is the alternative road I didn't take 3 years ago , now laid in front of me. I genuinely cannot put into words the excitement and what it would mean to me to explore this field alongside brilliant minds, learn from experts, and contribute to cutting-edge research. It would be an honor beyond measure and

a special segment to add to my life story. Thank you for considering my application, and I eagerly await the opportunity to be part of the SGI program.

Sincerely,

Alexander K. Alema

Attached: Curriculum Vitae