Dear Georgia Tech Research Institute Hiring Manager,

My name is Max Grinchenko, and I am applying for the entry level mathematics position 957. My passion for math stems from having coming to this country at the age of seven not knowing a single a word of English. When I started 3rd grade in America, the only time that I felt comfortable was in the math classroom. Ever since then, math has been a subject I excelled in, and one that has fascinated me greatly. I love thinking about the ways in which surface integrals sweep over space in higher dimensions. I love how one can transform a problem into the complex plane to find a simple and beautiful solution. Most importantly, I enjoy math problems for the sake of math problems.

I also have extensive math and physics research experience. During my time at the Gary Greenfield research group I helped publish two papers. Then, at Columbia University I worked in a programmer/analyst role to support the research my lab-mates were conducting. During these summer research projects**,** I successfully worked in a team environment with my compatriots to produce publishable data and results.

Throughout the two-year summer research fellowship at University of Richmond, my responsibilities included preparing and presenting presentations on a weekly basis, learning details of the year's project, writing parts of the paper, and setting them to be published paper in Latex. The first fellowship involved finding effective methods for computing the determinant of a large, sparse matrix.

Our research was centered around the rarely utilized directed graph method**.** By viewing matrices from the directed graph perspective, we were able to isolate certain repetitive patterns. The determinants of matrices with these patterns could be computed with a simple, closed-form equation. In the second summer, our group explored the RSA encryption algorithm. We looked at the simplified version of the encryption and sought to judge how the strength of the algorithm, as judged by a linear cryptanalysis attack, responds to small changes in the non-linear portion of the encryption**.** During these fellowships, I gained an immense appreciation for the amount of hard work it takes to publish a paper—not just from the research side of the project, but also through constructing a logical representation of the results. Furthermore, I learned how to speak about research in a confident, but, more importantly, accurate and precise matter.

I also have an extensive background in computer science, which grants me access to additional tools I need to solve a posed problem. For example, a typical math problem in a physics lab is to find the set of conditions under which a system maintains its stability. I can use my math skills to model this system with equations. Then transfer the problem to a programming language such as python, where I can find the stability conditions inherent to the system or gain more intuition about the system by plotting relevant data and behavior. I believe that having access to these tools greatly extends my problem solving flexibility. For these reasons, as wells as the ones mentioned earlier, I believe that I am uniquely suited for the job at the Georgia Tech Research Institute. I am excited to help solve real world problems, and I know that I will tackle them with enthusiasm and an open mind.

Sincerely,

Max Grinchenko