Personal Statement

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1 Basic Information

I am a senior student at Xi'an Jiaotong University majoring in Mathematics. My research interest is number theory, especially Modular Forms, Automorphic Forms and their L-functions. I am seeking to pursue a doctoral degree at Boston College.

2 Experiences

I discovered my passion for Number Theory in high school because of a magic theorem says an odd prime number $p \equiv 1 (\mathrm{mod}\, 4)$ if and only if it can be written as the sum of two perfect squares. After entering campus, I began to learn number theory in a structured way.

During my bachelor's degree, I read the initial two chapters and final chapter (Algebraic number field, local field and L-functions) of Neukirch's Algebraic Number Theory, the first three chapters of Fred Diamond's A First Course in Modular Form (basic concepts in Modular Form, dimension formula) and Tate's thesis (analytic continuation of Hecke L-functions).

In my first year on campus, I focused on studying foundational subjects in Mathematics such as Linear Algebra and Analysis. I attended a seminar Professor Xi organized that year. We discussed the first few chapters of GTM 84, covering propositions of Gauss Sum and some results about the number of solutions of some special Diophantus equations in finite field.

During the second year summer vacation, I successfully completed the written test and interview to participate in a summer school held by the Chinese Academy of Sciences. At the school, I learned basic concepts in Algebraic Geometry, Algebraic Number Theory, and Representation Theory.

In the third year, I enrolled in the Analytic Number Theory course taught by Professor Xi. I learned about classical ideas about exponential sums, Sieve method and the Prime Number Theorem. After that, I began reading Tate's thesis and obtained a comprehensive understanding of Hecke L-functions.

3 Future Picture

In my future study and research, what I really want to do is to discover the deep connection between number theory and other areas in mathematics such as Representation Theory and

Dynamic System. For example, I really appreciate Professor Venkatesh and Nelson's work since they apply many different methods from Lie Group, Microlocal Analysis and Dynamic System to study subconvex bound problem. But I cannot understand them completely at the moment.

Furthermore, I truly want to know how special values of different L-functions reflect the information of different arithmetic objects. The reason is that I find the Analytic Class Formula

$$\lim_{s\to 1}(s-1)\zeta_K(s) = \mathrm{Vol}\left(\mathbb{I}_K^1/K^\times\right) = \frac{2^{r_1}(2\pi)^{r_2}h_K R_K}{\omega_K\sqrt{|d_K|}}$$

has many useful and powerful corollaries. I want to learn and discover more results like that.

4 Something About My Transcript

(1) There's a non-accurate translation in my transcript. "Functions of Real Variable"should be "Real Analysis" since in this course, we mainly studyed the basic propositions of measure space, Lebesgue measure, L^p space and Radon measure.

(2) In the course called "Algebra Seminar" , we mainly discuss the first few chapters of GTM 256(A Course in Commutative Algebra).

(3) I took several programming and algorithm courses because I was interested in computer science, but now I am more interested in doing research in pure mathematics.

(4) The average score 87.43/100 is printed on page 7 of my transcript.