University of California, Berkeley

To Graduate Admissions,

Charles Stein has been an excellent student and research advisee of mine for the past two and a half years. I am very pleased to recommend him for graduate school at Berkeley. I am a junior faculty member at Trinity University, where Charles is pursuing a double major in Mathematics and Computer Science. I am in my sixth year, and focus on the theoretical and mathematical components of our curriculum. In addition to a highly successful research project, Charles has excelled in two of my courses: Functional Languages, a programming course designed to familiarize students with recursion and functional decomposition, and a Seminar on Formal Verification.

Charles exhibits not just an excellent grasp of mathematics, but the intuition to adapt his understanding to new mathematical concepts and communicate these concepts clearly. My Formal Verification Seminar covered a range of foundational papers. These papers, drawn from fields as diverse as formal logic, process algebra, and computer architecture, used a wide variety of notation. These notations were a consistent stumbling block as we read through the papers in class. When reading, Charles excelled at both devising a way to pronounce the mathematical notation, and summarizing each concept as we read past it. When it comes to understanding the arguably arcane concepts, he is one of the top two or three students in the class. When it comes to explaining them, he is unquestionably the best. These “soft skills” are just as vital as mathematical and computational skills, are harder to teach, and are vital for actually disseminating new ideas.

Charles is also an inveterate explorer and builder, tackling new concepts with enthusiasm. For the past two years we have been working on dsmodels: a domain-specific language for visualizing dynamical systems. This project is far from my research expertise: while I have some background in programming language, I have none in dynamical systems or visualization. The project was born out of Charles’ interest in a paper he presented for the mathematics seminar. To begin the project he had to become the expert on dynamical systems, learn the R programming language, and familiarize himself with visualization best
practices. The first version was released in a year, and we then transitioned into writing a paper. As I have never written a paper in DSLs, this requires Charles to read a wide body of papers, analyze their outlines, and figure out exactly what a paper on a domain-specific language looks like. We hope to submit the result to the RDSL conference in the next few days. dsmodels is far and away the most successful undergraduate research project I have undertaken, and represents a thesis level of work. While I have certainly provided advice, help code a few components of the project, and rewritten difficult sentences in our paper, the overwhelming bulk of the work is his.

Charles has all of the talent required to excel in graduate school, but there are two areas he could grow in. First, he has many academic interests. While this enthusiasm is wonderful, he can be easily diverted to new and exciting projects. Like many students moving from an undergraduate to a graduate setting, it will take time for him to learn how to focus intently on a single project. Second, the high-level organization of his writing could be improved. He is an strong writer, but over the course of ten pages he can lose track of the best place to present each concept. He attempts to guide the reader through his thought process, instead of ordering ideas for clarity. I have every confidence that Charlie will be able to navigate these challenges as he transitions to a more research-focused position.

In conclusion, I highly recommend Charles Stein for the Berkeley graduate program. He is motivated, talented, and I have every belief he will excel in research. His path to computer science has been wandering, but his strong mathematical background and aptitude more than makes up for the missed opportunity to take CS theory electives. For all of these reasons, I think Charles will make a fine addition to your program. Should you have any questions, I invite you to contact me at the number or email above.

Sincerely,

[Signature]

Dr. Seth Fogarty