

# Adam Berger (#4000)

Ph.D. F08, Full Time · [adam+cmu@addaon.com](mailto:adam+cmu@addaon.com)

## Biographical and Contact Information

Citizenship and Language			
Citizenship	Immigration Status	Native Language	SSN
United States	U.S. Citizen	English	122-72-0380

Biographical Information			
Date of Birth	City of Birth	Sex	Race
03/12/1982	New York, United States	Male	Caucasian / White (Non-Hispanic)

Contact Information		
	Current	Permanent
Address	1577 Quebec Ct #2 Sunnyvale, California 94087 United States	127 W 77th St New York, New York 10024 United States
Telephone	408-974-8847	646-709-1918

## Education History and Test Scores

Colleges Attended				
School	Major	GPA	Degree	Year
University of Utah	Computer Science	3.70	B.S. / S.B.	2003
Stanford University	Computer Science	3.62	M.S.	2006

Test Scores						
GRE				TOEFL		
Date	Verbal	Quantitative	Analytical	Date	Test Type	Score
12/2007	720	800	5.5			

## Research Interests

Ranked by the applicant.

1. One/multidimensional signal processing algorithms and methods (image, video, audio, array, wavelets/filters/transforms, statistical, methods/algorithms)
2. Processor microarchitecture
3. System design: Programmable, Logic, Circuit Fabric, Heterogeneous, Low Power, Emerging Platforms
4. Operating systems
5. Distributed systems

## Affiliated Programs

The applicant has also expressed an interest in the following programs at CMU:

- Information and Communication Technologies Institute

## Financial Assistance

**Do you wish to be considered for financial support from Carnegie Mellon?**

Yes

**Would you attend Carnegie Mellon without financial aid from the university?**

No

**Will you be receiving financial support from an outside agency (i.e., NSF, DOD, etc.)?**

No

**Are you applying for any financial support from an outside agency (i.e., NSF, DOD, etc.)?**

No

## Professional Experience and Resume

Employment History			
Company	Duration	Position	Responsibilities
Apple, Inc.	05/2004–05/2008	Software Engineer	

## Resume

Adam Berger adam@addaon.com

### 646-709-1918

**OBJECTIVE:** A position in a first-rank Doctoral program, giving me the opportunity and motivation to return to Academia after time in industry, and allowing me to do novel and interesting research that will leverage my real-world software engineering experience.

**EXPERIENCE:** OS Performance Engineering, Apple, Inc., Cupertino, CA - May 2004 to Present  
Internship, Agent Systems, Hewlett-Packard, Fort Collins, CO - Summer 2001

**EDUCATION:** MS CS, Stanford University, September 2003 to January 2006  
Honors BS CS, University of Utah, August 2000 to May 2003  
Study Abroad, Cambridge University, Summer 2002  
Study Abroad, Freie Universität Berlin, Summer 2001

**REFERENCES** available upon request. UNABRIDGED résumé available upon request.

## Statement of Purpose

After three years in industry, it's time to return to academia.

As an undergraduate at the University of Utah, I focused on the academic side of Software Engineering. I presented a poster on agent-oriented programming at the 2003 AAMAS conference in Melbourne, which matured into an Honors Thesis. While I spent a summer at HP, commercializing an agent system for calendar negotiation, I believed I wanted to stay in academia. Once I was accepted to several PhD programs, though, five years seemed like an awfully long time. As an alternative, I joined Stanford's Masters program, figuring I could either convert to the PhD program or find a local industry position. An internship at Apple my first summer lead to the second path.

At Apple, I worked on projects aligned with my interests. My internship project was to re-vamp Apple's scatterloading system. The principle of scatterloading is that language specifications don't specify the order that functions appear in a binary. The median function is smaller than a page, and few functions are used at once. By ordering functions the number of pages accessed (and thus memory used) can be reduced. Complicating this is the impracticality of building profiling versions of all of OS X; instead, running processes must be dynamically instrumented to gather any needed data.

This project appealed to me because it was open-ended engineering with a measurable impact. There's nothing cooler than spending three months running experiments and three months implementing non-invasive profiling, only to see a huge 10% reduction in total memory used. Because I was having so much fun, I stayed at Apple full time, returning to Stanford full time as well. My Stanford experience continued to be positive - I especially enjoyed doing a weekly lecture TA'ing a graduate-level C++ course - but my efforts focused on Apple.

Still, two years after graduating Stanford, and three years after joining Apple, I question whether industry is really where I want to be. I get to work on interesting projects on a regular basis - but I also work on projects hamstrung by deadlines, or inspired more by politics than engineering. I miss larger, open-ended projects with fuzzier deadlines and ambitious goals. I feel I would benefit from a chance to return to the classroom setting, to get to teach again as a TA, and to work on open-ended research projects. I would be unlikely to return to industry after earning my PhD.

As part of applying to CMU, I have had the opportunity to talk to Professor Püschel about the Spiral project. It matches my interests quite well - it is a large, open-ended project with ambitious goals, industrial-quality results (rather than being a proof of concept), and the potential to have a real impact. After discussion with him, I feel that doing research in this area would easily interest me as a doctoral project, and that my extensive experience in performance engineering is directly relevant and makes me a good candidate for the position.

## Letters of Recommendation

Letter #1		
Author	Position	Affiliation
<u>Robert Kessler</u>	Professor	University of Utah

1. How long have you known the applicant and in what capacity?

Since 2000 when he was an undergraduate student and then followed on as an undergraduate researcher under my direction.

2. In making this evaluation, what group are you using as a basis for comparison?

All undergraduates that I've seen over the past 25 years.

Please rank the student, as well as you can, along the listed dimensions. (Note that the scale is nonlinear.) Feel free to check "Insufficient Information" if you cannot make a judgement.

	1%	5%	10%	20%	50%	Below 50% Insufficient Information
3. Motivation and initiative	X					

- |   |   |
|---|---|
| 4. English communication skills         | X |
| 5. Creativity                           | X |
| 6. Intellectual ability                 | X |
| 7. Overall potential for graduate study | X |

8. Please describe the particular talents, strengths, and weaknesses of the applicant. If you have worked with the applicant on any sort of special project, please give an evaluation of his or her performance. Please indicate any favorable or unfavorable indications of individual (or team) research potential and the ability of the applicant to do independent work. Please indicate any additional information that you believe is relevant.

Well, what can I say? I think that Adam is great. Back in 2002/03 when he went through our program I thought that he was clearly the best student that I had seen go through our department in the previous 10 years (another student that graduated 2 years ago is slightly better), so that would make Adam the second best student in the last 15 years. I first met Adam 7 years ago when he took my CS3500 Software Practice class during the Fall of 2000. He was the top student in that class and literally blew my socks off. In that class, we spent the semester learning to write software using better style and techniques and worked on a semester long project of building a Lisp system. Adam became interested in Lisp and decided that he wanted to learn Java, so built (on the side) a Lisp interpreter in Java. He then wanted to learn about more sockets and network processing and extended it to be a Lisp server allowing remote client connections. All of this on his own. In the class he was clearly the star. For the final project, I offered several possible projects to extend the Lisp system. I made the joke that if anyone could build a Lisp compiler for our little Lisp interpreter, they would get an A. Well, he did just that (he worked with a team). They used his Java implementation and extended it with a compiler. It was amazing. I immediately talked him into joining my research group as an undergraduate research assistant. We worked together on a number of projects until the summer when he was hired by HP to work on agents (the genesis of this work was what we had been working on during the winter semester).

I spent the next year on sabbatical, but interacted with Adam off and on. In the fall of 2002, I was back from sabbatical and his ideas of a simpler, cleaner, more robust and powerful way to “do agents” had jelled enough that he wanted to do his bachelor’s thesis on the subject. His ideas coalesced into a form suitable for submission to the annual Agent conference. The paper was accepted for the poster session. I’m sure that the experience was extremely valuable for him. He learned the basics of how to be a researcher and what it takes to present your ideas in a short paper form. During the spring of 2003, he extended his prototype system into something that we experimented with as a whole new agent model.

After Adam graduated, he went off to Stanford for his MS degree. He did work on a number of areas including hardware, networking, and OO systems. While at Stanford he got an internship at Apple which he turned into a full time job. He has been there ever since, working in the performance team.

Adam is very eclectic with wide ranging interests. He is probably the brightest

undergrad that I have known and clearly would be an asset in your PhD program. I heartily endorse him for your University (I wish that we could snag him, but his interests and our specialties don't quite fit). You will not go wrong if you choose him. If you have any questions, please contact me.

**The following questions will be used by the graduate office for contact purposes only.**

9. What is your address?

50 S. Central Campus Dr. #3190; University of Utah; Salt Lake City, UT 84112

10. What is your telephone number?

801-581-4653

11. If you have one, what is your fax number?

801-581-5843

Letter #2		
Author	Position	Affiliation
<u>David Cheriton</u>	Professor	Stanford University

1. How long have you known the applicant and in what capacity?

Adam was a student in my class for one quarter and then acted as a teaching assistant. This was a total of 6 months, now 2 years ago.

2. In making this evaluation, what group are you using as a basis for comparison?

Stanford CS graduate students

Please rank the student, as well as you can, along the listed dimensions. (Note that the scale is nonlinear.) Feel free to check "Insufficient Information" if you cannot make a judgement.

	1%	5%	10%	20%	50%	Below 50%	Insufficient Information
3. Motivation and initiative			X				
4. English communication skills			X				
5. Creativity		X					
6. Intellectual ability		X					
7. Overall potential for graduate study		X					

8. Please describe the particular talents, strengths, and weaknesses of the applicant. If you have worked with the applicant on any sort of special project, please give an evaluation of his or her performance. Please indicate any favorable or unfavorable indications of individual (or team) research potential and the ability of the applicant to do independent

work. Please indicate any additional information that you believe is relevant.

Adam immediately stood out in my class, asking probing questions and raising interesting issues. He was bold in putting forward his views and I welcomed his involvement in the class. It was clear from his comments that he had significant real-world experience with software development, but also had given careful thought to software issues along the way. The next year he volunteered to TA the course and contributed to the assignments as well as running the tutorial sections, doing an excellent job. My overall impression is that Adam is a very smart, hard-working and knowledgeable guy who has a great foundation of practical background to dive into systems research and make some significant contributions. His initiative with my course certainly impressed me that he has the strong capacity for independent work. My first reaction to hearing he had decided to apply to Ph.D. programs was to ask him if he was considering Stanford. I think he would be a great admit to your program, and give him my strongest recommendation.

**The following questions will be used by the graduate office for contact purposes only.**

9. What is your address?

Computer Science, Stanford University, Stanford CA 94305-9040

10. What is your telephone number?

650-723-1131

11. If you have one, what is your fax number?

Letter #3	Author	Position	Affiliation
	<u>Lee Bernhard</u>	Software Engineer	Apple, Inc.

1. How long have you known the applicant and in what capacity?

I have worked with Adam in Apple's OS X Performance team for two and a half years as peers and colleagues.

2. In making this evaluation, what group are you using as a basis for comparison?

I am comparing Adam against other software engineers at Apple with their Masters and fewer than five years of industry experience.

Please rank the student, as well as you can, along the listed dimensions. (Note that the scale is nonlinear.) Feel free to check "Insufficient Information" if you cannot make a judgement.

	1%	5%	10%	20%	50%	Below 50%	Insufficient Information
3. Motivation and initiative			X				
4. English communication skills			X				
5. Creativity		X					

6. Intellectual ability X

7. Overall potential for graduate study X

8. Please describe the particular talents, strengths, and weaknesses of the applicant. If you have worked with the applicant on any sort of special project, please give an evaluation of his or her performance. Please indicate any favorable or unfavorable indications of individual (or team) research potential and the ability of the applicant to do independent work. Please indicate any additional information that you believe is relevant.

Adam is the most talented software engineer in the OS X Performance Team and ranks among the top percent of young software engineers that I have come across in thirteen years of industry experience. Adam brings a broad and deep knowledge of C.S. and Electrical Engineering, a bold and creative mind, and a startling drive to accomplish his goals. When Adam has a project he's passionate about, he bends the world to accomplish it.

One of his most notable achievements in the Performance group was the adoption of symbol ordering techniques to optimize memory footprint of binaries. He began this project as an intern at Apple and continued it as a full-time employee. It is the single most important memory footprint change that Apple has adopted in years.

I have every confidence that Adam would be an asset to any research organization. He is capable of independent work. He also possesses leadership skills and would be a good team leader on a project. His present job routinely demands that he work closely with other Apple engineers to discuss design issues. He is generous in offering ideas to his colleagues (who often seek him out for advice). I believe Adam would also benefit any undergraduates he taught or mentored--he is an excellent teacher.

**The following questions will be used by the graduate office for contact purposes only.**

9. What is your address?

516 Vincent Dr, Mountain View, CA 94041 or lee.bernhard@gmail.com

10. What is your telephone number?

650-799-8801

11. If you have one, what is your fax number?