

University at Buffalo
State University of New York

Department of Computer Science and Engineering

August 20, 2013

Natalie LoCascio
Human Resources / Recruitment
Google San Francisco
345 Spear Street
San Francisco, CA 94105
Re: applicant Robert L. Surowka

Dear Ms LoCascio:

I am delighted to provide a reference for Mr. Robert Surowka. Thirty months ago, when he had TA-ed two courses for me and taken part in my seminar but was still being advised by my colleague Professor Jan Chomicki in a different area from mine, I wrote a rather wild letter for a Microsoft Research internship. Perhaps you have a system of labeling letters “+1,” “+2,” “+3” and so on. Mine was a “+3” letter, but as a sum of “-2” and “+5.” I wrote some things that could strike terror in a prospective manager, but also wrote, “He’s the proverbial person-who-might-cure-cancer, with strong lab and programming skills to back up the outlook. He is also conscientious and follows schedules perfectly.” Sandwiched around that, I wrote: “[His seminar presentation] was the best, despite his advisor [Chomicki] having asked me in the summer, ‘Why is Robert into quantum [computing]?’ No distraction will slow him—my impression is he could complete his PhD dissertation within 18 months. I would be happy to have him as my own research student—he could advance my work if it caught his fancy.”

Now I can say both that he has joined my work and has mellowed into a delightful collegial companion. More than the latter, he has been essential personal support for a department secretary who has been going through some tough times—it’s a real friendship. He is not slated to TA for me this term because he is needed back with the course he assisted last term which has a lot of underclass-level students who need hands-on help from people with good English skills.

I have been his PhD advisor effectively for 9 months, since the past 3 months have been with you, leaving him 9 more months to make good on my old estimate. He has indeed advanced my work: he impressed me by doing something on his own last winter that I first regarded just as a mathematical plaything, but after his development turns out to be bearing on questions about quantum computation which I raised in a blog article

<http://rjlipton.wordpress.com/2012/07/08/grilling-quantum-circuits/>

on joint work begun with an Indian researcher long before Robert came to UB. We are submitting a joint paper to a conference this month, and it has the interest of several mathematicians in Kansas and Australia. It’s about whether polynomials over *rings* that

are not *fields* can be tamed, and some open problems in computational complexity theory (like P vs. NP but at a lower level) are bound up with that kind of question.

Since we have a previous (smaller) paper, and since the standard equation is “thesis = 3 papers,” I’ll put my money on his finishing at least a full dissertation draft in those 9 months. He has that in his sights because he is applying for jobs beginning next summer. He is well versed in object-oriented programming where ‘jobs’ denotes a *class* rather than a plurality of instances—I do not know of any other planned applications at this time and we have not yet had “the talk” about applying into academia here-or-home instead.

The other paper is about low-level complexity classes, and appears in the proceedings of a graduate conference in his native Poland, but some ancillary work he did for it affords a good snap of his intellectual character. The blog I write for is one of the best known in theoretical computing, and Dick Lipton and I intersperse technical articles with genial mind-candy posts, including a regular April Fool’s item. This time I wrote one to convey a semi-serious point about the search for extra-terrestrial life,

<http://rjlipton.wordpress.com/2013/04/01/interstellar-quantum-computation/>

with the premise of intricate quantum circuitry being found in the Chelyabinsk bolide fragment. The circuit diagram I gave, however, was *real*—it was done by Robert to help him understand the theorem we were proving in the paper, which was almost all his work in the final writeup. I made a reduced-density thumbnail for the blog post, but gave the link to the original on the word “diagram” above it—and if you click it and the big PNG file doesn’t stress your connection, you’ve got great bandwidth. The diagram is pretty *packed*. I see Google values people with an artistic as well as technical turn of mind, so I’ll let that serve as the *meishi* for conveying at a glance why Robert would be an excellent long-term associate for Google.

In sum I can give him my highest recommendation. I will be happy to answer any further questions you may have.

Yours sincerely

Dr. Kenneth W. Regan