

PARTNERS IN PERISCOPE

Young Alumni Tap Big Data Market

Harry Glaser '07 and Tom O'Neill '07 met in the fall of 2003 during their freshman year at Rochester, and have been fast friends ever since. In 2012, they left their jobs at Google (Harry) and Microsoft (Tom) to form a start-up. This venture has now become their company, Periscope, and their product is a data analysis software tool. Edmund Hajim, benefactor and namesake of our Hajim School of Engineering, has spoken often about his 4 "Ps" as the keys to success in business: Passion, Partners, Principles, and Plans. In this recent interview with Marty Guenther, read how Harry and Tom are on the track to success based on Hajim's rubrics:

MG: When did you two first become friends? Did you meet in class/workshop/lab/dorm??

HG: We met the first day of freshman year on our freshman hall, Hollister 4. When I arrived and walked down the hall for the first time, Tom was already set up in his room. He was immediately identifiable as the other CS nerd because he had two flat screen monitors—in the year 2003! We became best friends, roommates and classmates all four years. (Partners)

MG: When you graduated from UR and went your separate ways (to Microsoft & Google), was there always a plan that you'd work together at some point in the future?

HG: We always knew we wanted to start a company together. Our jobs at Microsoft and Google were great opportunities to get real-world experience and make industry connections. After a few years, we felt it was the right time to leave the nest and start something of our own! (Plans)

MG: What was the most difficult problem you've faced so far in the creation of a start-up?

HG: Honing in on the right product took some time and effort. The key is not to be afraid of failure – in fact, embrace it as early as possible in the lifespan of an idea, and move onto the next thing. The most important thing was persisting until we found something that was both technically innovative and really valuable for customers. (Principles)

MG: Why do you think your start-up will be successful?

HG: We have the best team. They are all former URCS classmates and former colleagues from Google and Microsoft. We're all old friends who have worked together before, so we work (and



play!) very well together. (Partners)

MG: Since you didn't know what your product (though you wanted it to be innovative and important) was going to be when you started, how did you decide on the current concept of Periscope?

-HG: Our goal was to try many different ideas quickly, and fail fast if they didn't work out. We would come up with ideas and prototype them quickly over a weekend and then have friends, former classmates, and former colleagues try them out. If they didn't stick, or if we weren't as passionate about them as other ideas, we'd move on to the next prototype. (Passion)

Periscope began as a tool that we used to analyze data from one of our previous projects. We were unable to find a data analysis tool that was fast enough and flexible enough for our needs, so Tom built the first version of Periscope for us to use in just one day. We began to seriously consider it as a business idea after friends saw it over my shoulder and asked if they could use it for their own projects as well.

MG: What does Periscope do?

HG: Periscope uses probabilistic algorithms to analyze large quantities of data much faster than any other tool. By using a statistical sample of the underlying data, we can achieve multiple orders of magnitude speedups. In the best case, Periscope is 1,000 times (or more!) faster than naive techniques. Queries that would run overnight in SQL or a MapReduce can run in

seconds or milliseconds on Periscope.

Data analysts and business people both use Periscope to answer questions like:

- What is the lifetime value of a customer that comes from Google AdWords vs. Facebook Ads vs. organic search?
- How is user retention affected by sending email, SMS and mobile phone notifications to those users?
- What is the average revenue per paying user for each of my video games?

MG: Who are your customers and why do they find your software attractive?

HG: We sell primarily to mid-size tech companies. Video game companies tend to be especially excited about Periscope because they're so data-driven! We started out selling to small companies, and started selling to larger companies as our technology became more robust.

MG: What competition is there in this market and how is your product different?

HG: Most data tools are built on top of specialized databases called data warehouses. You have to copy all of your data into them before you can do any analysis. This typically takes days or weeks, and then you have to wait each day for the previous day's data to become available.

HG: Periscope is a technological shift: Using our probabilistic algorithms, we can query the customer's data stores directly, and get answers instantly, without any waiting at all.

MG: As you grow, how do you think your company will change?

HG: Ideally as little as possible! The team right now is very tight-knit, owing to us all being good friends and the small-company atmosphere. We will have to be vigilant as we add folks that they fit into the company culture. We want them to be having lots of fun with us, and we want to be having lots of fun with them around! (Partners)

MG: What part of your UR experience was most influential in your success?

HG: Most importantly: Our friendship!! The challenging and very theoretical curriculum was great. It gave us the ability (and confidence) to build a technically sophisticated product, and develop new algorithms to use in our product when necessary. The small department and small class sizes were awesome for building relationships with fellow students, professors and TAs. The sense of collaboration that was encouraged in the department led to us building several side projects. (Partners)

MG: When you were students, you did several independent studies including a game called AwesomeCraft. How did this CSC experience prepare you for your adventure?

HG: The relationships with fellow students and the early experience working on real shipping software with a team of developers was great. Seven of the eight students who worked on AwesomeCraft now work in the tech industry in the Bay Area and 3 work at Periscope! (Partners)

MG: Did your jobs at big tech companies help you with business & management skills you might not have learned from your formal education?

HG: Yes, definitely. It taught us how to lead teams of developers, and multi-functional teams including designers and businesspeople. It gave us many industry contacts that have been invaluable. And it taught us how some of the best real-world production software is built.

MG: What are your managerial functions and how did you determine who would do what job?


HG: Harry CEO; Tom CTO; this plays to each other's strengths.

MG: Why do you believe you were successful in obtaining venture capital/investors?

HG: Opening slide! Venture investors are primarily betting on the strength of the team. In our case I think they

periscope

TEAM: Working Together For 9+ Years


Winning Team
2006 CS Games

Harry Glaser, CEO
Google AdWords
UNIVERSITY OF ROCHESTER Computer Science

Tom O'Neill, CTO
bing Search Quality
UNIVERSITY OF ROCHESTER Computer Science

saw a strong, tight-knit team with a great background. (Partners and Passion) •

MG: Did you know about URCS's push toward Data Science and becoming a Big Data Center? Do you see potential for collaboration in the future?

HG: We think there could potentially be great opportunities for collaboration.

MG: It is most CSC majors' dream to be lucky enough one day to create an awesome start-up. What would be your best advice to them?

HG: First and most important: Just do it! Too many people never take the plunge. It's definitely worth it. Get your friends together and build lots of things with them. It doesn't matter what it is. What matters is the experience of building and shipping software in teams and the relationships you'll form with your fellow students. Our entire URCS friend group is out here in the Bay Area. We hang out all the time, hire each other at our companies, and work together as much as we can! Don't be afraid of failing. You can learn as you go, and as long as you're persistent, chances are you'll find something successful.

End note: In the commencement program each student is asked to write parting thought to friends and family. Fellow 2007 classmate Michael Rotondo wrote as his statement, "As incredible as the professors in this department are, each in their own right, I've been more inspired, invigorated, and delighted by my fellow CS majors than I ever thought possible. Shockingly bright, creative and fun, they are the future, and I can't wait to see what they do now that they've been unleashed on the world." Almost echoing Ed Hajim's four "Ps" of success, Harry Glaser and Tom O'Neill have passion for what they are doing, principles to live by, a plan for the future, and the strongest of partnership. Up Periscope, full speed ahead!

"Many opportunities exist in the burgeoning field of Big Data science. The field of Big Data not only presents a sea of lucrative business opportunities for agile start ups like Tom and Harry's venture, but also poses a host of challenging computational questions for university researchers. As commercial and academic interest in this field continues to grow at geometric rates, collaborative opportunities between entrepreneurs and faculty should become increasingly numerous. Occasions for collaboration, joint projects, and student internships should facilitate the cross-fertilization of this this opening and expanding field of endeavor where new ideas, solutions, and products are explored and developed.

As undergraduates in the University of Rochester's Department of Computer Science, Harry and Tom stood out at a pair of movers and shakers who lead others while taking full command of their own educational experience. In addition to their coursework, they honed their interpersonal leadership skills by serving as Computer Science Teaching Assistants. In addition to completing projects assigned in classrooms, they conceived new ideas and pitched them to faculty as independent study projects recruiting and motivating other talented students to join in along the way. They made their educational experience their own, preparing the way for this launch of a new venture in the real world."
—Ted Pawlicki