



This blog hosts weekly news about the Texas A&M University Sketch Recognition Lab. SRL is directed by Dr. Tracy Hammond, an associate professor in the Computer Science and Engineering Department. More information about the lab can be found at <http://srl.tamu.edu>

Thursday, July 9, 2015

SRL Undergraduate Students Win 5 Awards at TAMU Student Research Week 2015

The 2015 Student Research Week (SRW) at Texas A&M University marked its 18th poster and presentation extravaganza over the days of March 24th through March 27th. The Sketch Recognition Lab, directed by Dr. Tracy Hammond won 10 awards at the annual event; five of these awards were awarded to undergraduates taking capstone or senior research credits.

The following is a list of Sketch Recognition Lab Awards at TAMU Student Research Week 2015. Bolded are those from undergraduate students working with lab director Dr. Hammond.

1. **2015 Sigma Xi Interdisciplinary Award. TAMU Student Research Week, SRW 2015. gRec: A Gesture Recognition Interface for CourseSketch. Gutierrez, A.****
2. **2015 1st Place Undergraduate Oral (Subject Area: Math, Statistics, Computer Science) TAMU Student Research Week, SRW 2015. Wood, H.**, Vangavolu, H.**, Newman J.** Frontier**
3. **2015 1st Place Undergraduate Poster (Subject Area: Math, Statistics, Computer Science) TAMU Student Research Week, SRW 2015. gRec: A Gesture Recognition Interface for CourseSketch. Gutierrez, A.****
4. **2015 1st Place Undergraduate Oral (Subject Area: Health, Nutrition, Kinesiology, Physiology) TAMU Student Research Week, SRW 2015. Bowersox, M.**Brown, W.**, Sauers, C.**, Shoot Responsibly**
5. **2015 2nd Place Undergraduate Poster (Subject Area: History, Literature, Fine Arts, Communication, Languages, Philosophy) TAMU Student Research Week, SRW 2015. KidGab: A Social Media Tutorial. Zhang, H.**, Privett, J.**, Tian, F.**, Mulholland, T.**, Carrasco, M.**, Cestafe, E.****
6. 2015 1st Place Graduate Poster (Subject Area: Math, Statistics, Computer Science) TAMU Student Research Week, SRW 2015 Poster Competition. Approximate Sketch Matching and Retrieval. Ray, J.*
7. 2015 2nd Place Graduate Poster (Subject Area: Math, Statistics, Computer Science) TAMU Student Research Week, SRW 2015. Optimizing Corner Finder. Garg, A.*, Ray, J.*, Polsley, S.*
8. 2015 2nd Place Graduate Oral (Subject Area: Math, Statistics, Computer Science) TAMU Student Research Week, SRW 2015. SmartStrokes: Evaluating Sketches from Neuropsychological Tests. Lara-Garduno, R.*
9. 2015 2nd Place Graduate Poster (Subject Area: Medicine, Biomedical, Neuroscience) TAMU Student Research Week, SRW 2015. Modeling Radiologists' Visual Search Patterns during Mammographic Screening. Alamudun, F.*
10. 2015 2nd Place Graduate Oral (Subject Area: Psychology, Sociology, Anthropology, Business, Education, Political Science, Economics) TAMU Student Research Week, SRW 2015. CourseSketch. Turner, D.*

The Sketch Recognition Lab enthusiastically extends its congratulations to members and groups of the senior capstone course, taught by the Director of the Sketch Recognition Lab, Dr. Tracy Hammond, who were awarded for their innovative projects.

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Blog Archive

▼ 2015 (11)

▼ July (1)

[SRL Undergraduate Students Win 5 Awards at TAMU St...](#)

► April (3)

► March (6)

► February (1)

► 2014 (6)





(From left to right: Jaideep Ray, Harish Vangavolu [for Frontier], and Abram Gutierrez)

Held by the Graduate and Professional Student Council (GPSC) in tandem with the Office of Graduate Studies, Vice President for Research, Department of Student Life, and Undergraduate Programs & Academic Services, SRW celebrates and showcases student research in the form of posters and oral presentations.

Moving for a moment away from the academic side of SRW, it is also important to note that the week is specifically an aggie operated event – graduate students initiate the event by planning and organizing it. This allows for the community feeling of support generated by students at the event – competitors, judges, and sight-seers alike.

As described on SRW's website, it is a place where academic areas "are connected in hopes to spark collaboration, discover common ground, and challenge students, faculty, and staff at Texas A&M to consider the importance of research in our community and world."

This striving for a place where students and faculty can come together and share research and support across diverse areas of study was the main driving force behind the theme of the event – Connecting Ideas.

As with all competitions, an awards ceremony is held on the evening of the final day of SRW. It came as a pleasant surprise that SRL and the senior capstone groups placed numerous times in various areas.

Abram Gutierrez, SRL undergraduate senior, won first place for Undergraduate Poster in Math, Statistics, and Computer Science and was also given the SigmaXI Interdisciplinary Award. *"I was quite surprised," Gutierrez commented. "I wasn't expecting it, actually."*

Under the mentorship of Paul Taele, David Turner, and Dr. Tracy Hammond, Gutierrez was doing a single person research project on this topic. gRec, his project, is an interface that allows people to control PowerPoint presentations with gesture recognition (hence the play on the name). The end goal of the gRec is to incorporate it into CoreSketch lecture modules to make a more natural teaching environment.

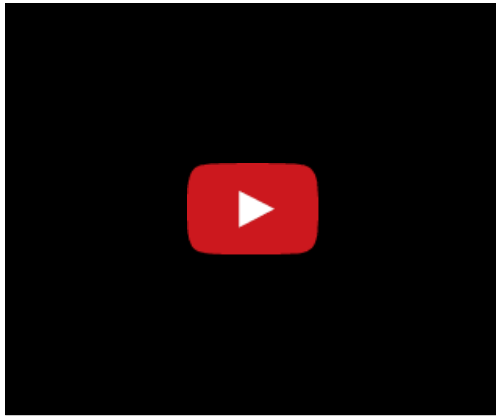
By using hand gestures, a user will be able to advance slides, go back in a presentation, stop a command, play an embedded video, and click on a hyperlink. This allows for a presentation experience that is not weighed down by having to manually control the PowerPoint.

"People typically like to use their gestures in conversations, because it helps demonstrate points more clearly," he stated. "But sometimes you're restricted by some of the hardware, like you may have to stick to a keyboard – you can't necessarily move around and be passionate about your topic."

gRec would, then, create a natural user-interface. A presenter would not have to use a hand-held device or have pointer gestures to control their slides. They would just have to use the registered gestures that are translated into commands.

"If I close my hand, that will be the equivalent of putting a pen down on a sketch pad," Gutierrez explained the recognition process. "It will read the gesture of a closed fist and when you open your hand, it's like taking the pen off. Once it stops scanning, it will consolidate all the points it collected and send it to a processor."

"I'm a graduating senior," he began when asked about the future of gRec. "So I won't be able to see it to its full scale. What I'm trying to do is make the framework open, so that students of future generations can go ahead and build upon the framework and improve it, speed it up."



Fire Mongooses, a senior capstone group advised Dr. Hammond and KidGab creator Stephanie Valentine, was awarded second place for Undergraduate Oral Presentation in History, Literature, Fine Arts, Communication, Languages, and Philosophy. The largest capstone group of the spring semester, Fire Mongooses is comprised of mentor Stephanie Valentine, TA Cassandra Oduola, and students Joshua Privett, Harry Zhang, Frank Tian, Matthew Carrasco, Thomas Mulholland, and Eliezer Cabrera.

"We are taking a previous project called KidGab, which is a safe social media for kids, and expanding it to include moderation," Thomas described Fire Mongooses' project. "Things like content flagging, word filter, and bully control." The bully control moderation is able to find negative posts on the site and automatically delete them.

When asked about how they celebrated their award, Privett responded. "We'll celebrate when we finish this. We've been working hard, so the presentation was kind of like 'okay, let's do this and get back to work.' Even though we got second place, we're not done with the project, so it's hard to celebrate."

The presentation and SRW provided an engaging and interesting break for the group. One which they were able to enjoy and gain positive experience and recognition for updating and crafting a socially aware project.



(Frontier giving their oral presentation)

Placing second for Oral Presentation in Math, Statistics, and Computer Science was the Frontier capstone group. Harish Vangavolu, Hayden Wood, and Joseph Newman make up the Frontier capstone group and are mentored by SRL member, Seth Polsley.

Frontier is working to revamp how web browsers track history and stack websites.

"Instead of providing a linear list, we're providing a graph structure," Wood began the explanation.

"If you go to a webpage ten times," Vangavolu added, "it will appear stamped in your history ten times. But we can consolidate that into one node on a graph."

"With the traditional back and forth buttons," Newman continued, "you are limited to just one route. So if you go somewhere else, it overrides what it was previously, so you lose the links to all other pages."

So, imagine a blue dotted line. This is the current way of tracking history on a browser – each dot is a different webpage that was visited by a user. If you pick a dot, though, in the middle of the line and begin to color over

the rest of the dots in red, you've lost the original, blue line.

Likewise, when a user goes uses the back command in a browser to return to a previous page to click a different link, all the information from that point and on is lost (for anyone who has lost a webpage because of this system, you know how annoying it can be).

However, if the original dotted line were not a line at all, but a series of circle-graphs, each connected to but not dependent on one another, then users would not lose links by backtracking on the graph, they would just create a new circle section.

"Browsers haven't changed since the 90's," Vangavolu stated, "and we have so much more computing power that can be utilized."

"It was a mutual criticism of current web browsers," Wood commented on the motivation behind the project. "There are so many things that you think of when you navigate that you wish existed, but were never developed. Then you get into a group like this and you really start thinking about it."

If time allows and the program tests well, Frontier hopes to find a way to release and sell their new browsing system as an application for browsers.

Finally, Shoot Responsibly was awarded first place for Undergraduate Oral Presentation in Health, Nutrition, Kinesiology, and Physiology. Making up this group is Waylon Brown, Chandler Sauers, and Matt Bowersox. Mentoring them is Jory Denny.

"Our goal is to make gun training as safe as possible," Brown explained. "Because anyone who wants to fire a weapon needs to go to a gun range and learn with an actual weapon that's fireable which does include some safety concerns."

Their solution? A virtual reality gun range and fire arm training program. Using an Oculus Rift and Hydra controllers, Shoot Responsibly creates a digital shooting range that takes a user through a similar gun safety routine as would be seen at a real-world range.

"It's a fully working range," Brown continued, moving the camera around the virtual shooting area as he spoke. "So you can actually fire at the targets." The system critiques you if you point away from the range with your gun, and helps remind you about your safety.

When asked about the SRW experience, Bowersox commented, "I thought it was interesting, just seeing the different projects and how ours fit in with them."

Shoot Responsibly was in the kinesiology and health category of SRW, making their project an odd man out. "Other projects were about diabetes and cultural things," Bowersox laughed. "Ours was very different."

"The main drawback is that it took us about two months to get these," Bowersox added, gesturing to the controllers. "They're really snazzy, but hard to find."

"I feel like there is some actual at home potential," Brown concluded. "You don't have to spend money on ammunition and things like that."

As for the future of Shoot Responsibly, the group hopes to see it implemented as an alternative to current gun training.

Hammond states "Guns are a part of Texas. I am excited to aid in the development of software to improve gun safety. I am super proud of the Shoot Responsibly team and all of my students."

Posted by [Hannah Conrad](#) at 3:23 PM




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