National Resource for Network Biology: Student Profile

Menghe Zhang was enrolled in 2017 Google Summer of Code (GSoC). Over the summer, she worked with her mentor Barry Demchak and Scooter Morris to design and develop the prototype of 2d network graph renderer, which takes advantage of high speed GPU calculation.

- Student Project Source Code: https://github.com/ZhangMenghe/PokeMeow-Renderer

- Student Project blog: https://mez071.wixsite.com/2017gsoc

- Brief Description: This 2d renderer (Pokemeow) is aimed to be integrated into Cytoscape 3.+. Visualizing a complex network requires a great deal of calculations, thus takes a long time to render large networks with original software-based engine. This project aims to replace the original Cytoscape-2D engine to make it proficient.

Q&A

Where did you attend university during Google Summer of Code (GSoC) 2017?
I was a first-year graduate student in UCSD, Computer Science and Engineering Department.

How did you first hear about the GSoC program?
I first heard of GSoC through a flyer in UCSD. Though I've ever worked for an open source software before.

How did you first hear about NRNB and Cytoscape?
I heard about it from Prof. Schulze's lecture, in which he briefly introduced this NRNB project and encouraged us to have a try if we have related experience. Since I'm pretty interested in computer graphics and worked for a game engine before, I decided to apply this Cytoscape program.

What was your experience with GSoC?
I had little experience designing and building a renderer from nothing; also, I rarely needed to consider how my work could be used by others. Thanks to my mentor gave me opportune guidance every time. Therefore, I really enjoyed this process: from design, implement, discuss, display.

What are some of the parts of work you have done?

Check JOGL environment
- There should be a rotating cube changing color inside viewport.

Viewport and control
- The viewport in Cytoscape consists of several internal frame. Use viewport demo to create multiple internal frames and you can use mouse to

- o Pan (Right click)
- o Rotate (ctrl + Right click)
- o Zoom (mouse wheel) the canvas.

Hit Test (mouse pickup):
- o Mouse pickup. Click on the nodes, position and hit id will be shown in console.

Drawing
- o Draw all kinds of nodes: 10 kinds of nodes with color / Gradients texture. Also, rotation / scale / transformation / setZorder are applied
- o Draw all kinds of arrow: 12 kinds of arrow shape with color Also, rotation / scale / transformation / setZorder are applied
- o Draw all kinds of lines: 13 kinds of lines drawn using pure OpenGL now.

Off-line drawing
- o Draw components on an offline texture and then redraw the texture on screen.

What you are doing now and what are your next career goals?

I'm working on my master thesis now, which is related to computer vision and augmented reality. Working for Cytoscape gave me more courage to work and research independently. Besides, I'm now pretty sure that I enjoy challenging work, so I intend to apply for a PhD program in near future.