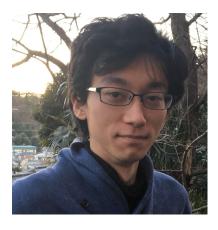# National Resource for Network Biology: Student Profile

Takahiro Yamada was enrolled in 2017 Google Summer of Code. He worked with his mentors Andreas Draeger, Matthias König, and Kaito Ii to develop a Web Application for SBML (Systems Biology Markup Language). This web app performs time course simulation, steady state analysis, and parameter estimation with high availability.

Student Project Source code:
https://github.com/TakahiroYamada/GSOC2017_SBMLModelAnalysisWebApp

Student Project Blog: http://gsoc2017developwebservice.blogspot.jp/

Mentor's Quote: "Takahiro is a quick learner and a self-motivated hard worker. Takahiro tackled challenging tasks and has surpassed our expectations. I was very fortunate to get to work with him."

Where did you attend university during Google Summer of Code (GSoC) 2017?

I attended Keio University in Japan as a student in PhD course of systems biology.

How did you first hear about the GSoC program?

I heard GSoC from my supervisor, Dr. Funahashi. I knew this program's detail through my colleague and mentor, Mr. Ii, who attended this program last year.

How did you first hear about NRNB and SBML?

Dr. Funahashi was a member of NRNB and Mr. Ii worked on the GSoC project for NRNB. Therefore, I had already known NRNB and GSoC beforehand. Regarding SBML, I used it in my research and knew it since in bachelor course. I was deeply interested in SBML to formalize biochemical reaction.

What was your experience with GSoC?

I have analyzed biological phenomenons using SBML before and I knew some obstacles of analysis. Therefore, I had many ideas to deal with it. However, I faced many problems after I tried to implement prototype of analysis tool in server side and UI in client side based on my idea. My mentors immediately advised the way to solve these problems. For example, the visualization of some object on web browser suddenly changed just after hovering the cursor on it. They pointed out the object of Javascript should be singleton to aforementioned problem. After my prototype was reviewed by my mentors and revised based on it, I finished the implementation of web application to execute analysis of simulation, steady state analysis and parameter estimation.

What was your experience after GSoC?

The implementation of our web application was very convenient and powerful tool to analyze biological phenomenon based on SBML. However it was insufficient in terms of maintainability in server side. In order to solve this insufficiency, we started to add task queue system as middleware for this web application.

What are you doing now?

I have already designed and started to implement task queue system for this project. In parallel with it, I wrote the article for this web application. After publishing it, I hope many biologist can be attached to systems biology to uncover their own biological question.

What are your next career goals?

I am researching inference of gene regulatory network from time series data right now. The information of the reaction is crucially important if the methodology of systems biology is applied. However, these informations are insufficient regarding gene regulation. My next goal is to formalize the methodology accurately to infer gene regulatory network and to connect this methodology and the analysis based on SBML in order to uncover various biological phenomenon.

I would like to thank to my mentors, Dr. Andreas, Dr. Matthias and Mr. Ii for kind advice to my implementation. And I would like to thank to Dr. Funahashi for informing me of GSoC and many technical advices and coding.