



SIMON FRASER UNIVERSITY
ENGAGING THE WORLD

Invent The Future 2019

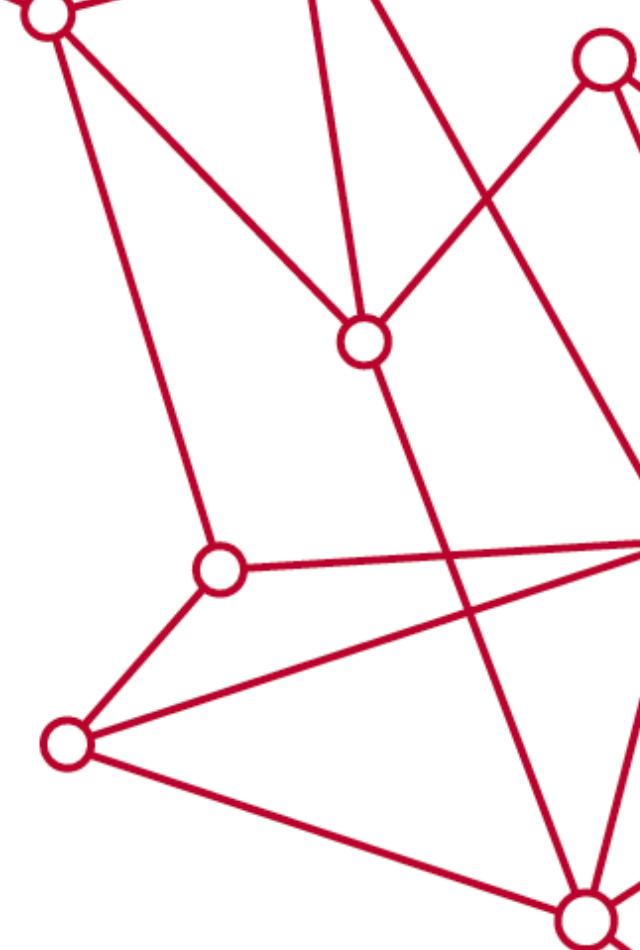
Mentor Welcome Day



Invent The Future (ITF)

- Two-week summer enrichment program
- Grade 10 and 11 young women
- Explore the world of AI through
 - Team projects
 - Industry field trips
 - Connecting with mentors & industry experts
 - Supportive yet challenging environment

Learn More: <https://www.sfu.ca/computing/inventthefuture.html>



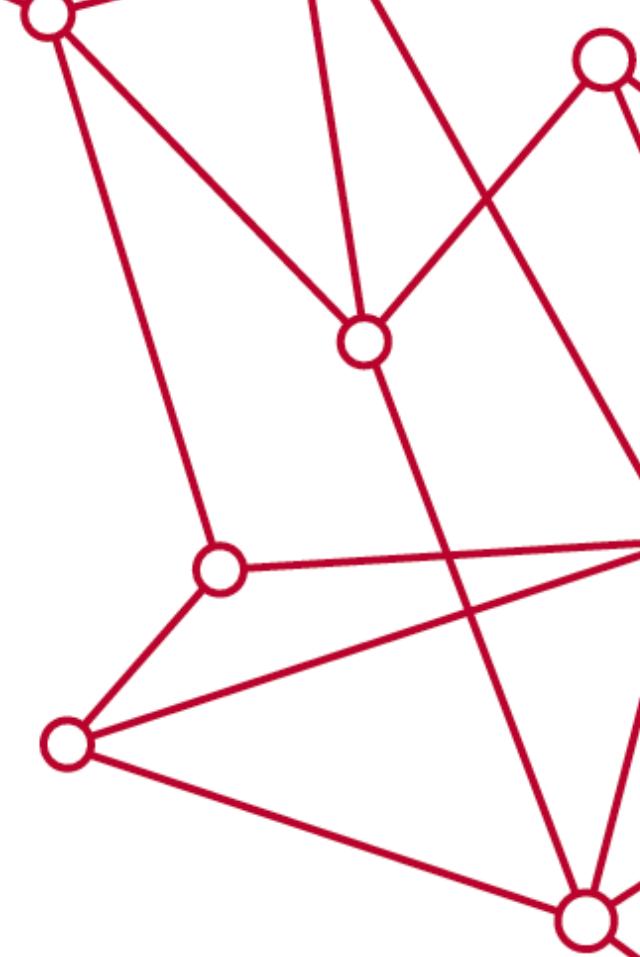
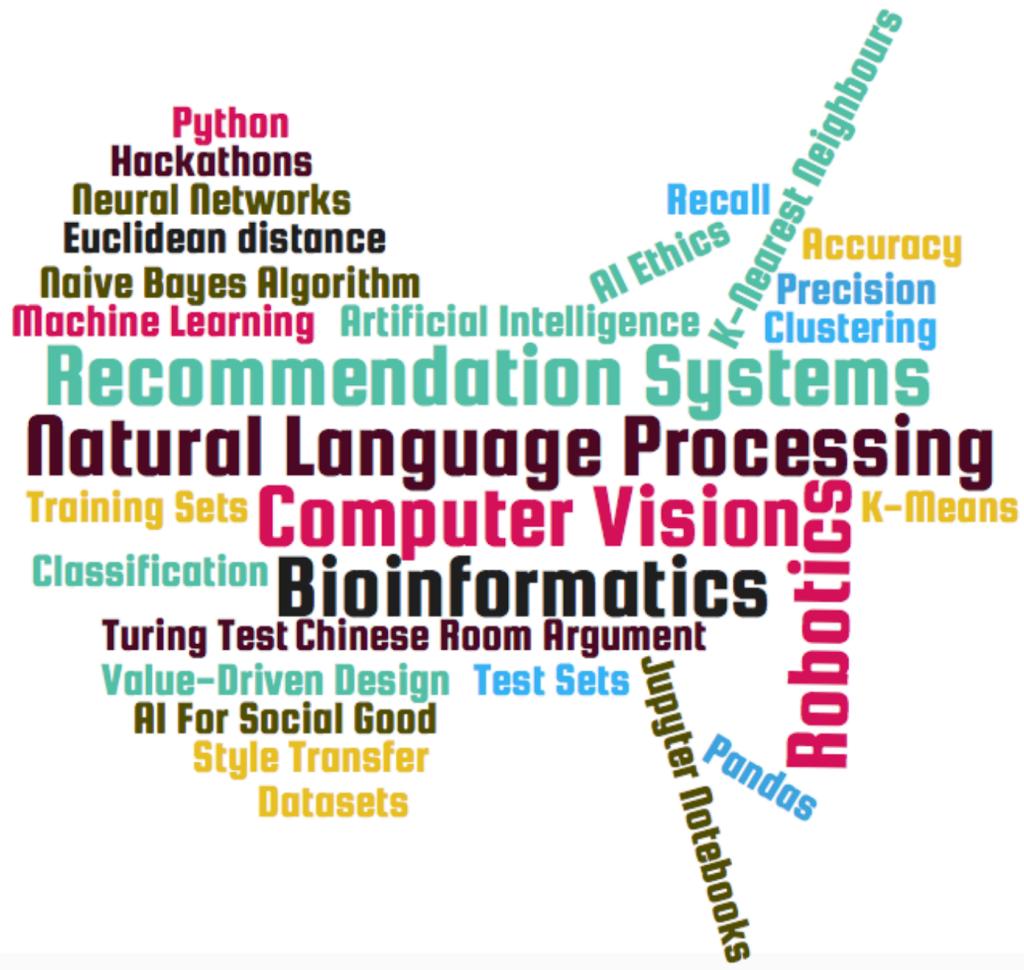
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AI Will Change the World. Who Will Change AI?

AI4ALL is Educating the Next Generation of AI Technologists, Thinkers, and Leaders

Breaking the Barriers

- Access
 - Awareness
 - Exposure
- Interest
 - Technical Training
 - Confidence
 - Feeling of Belonging
- Persistence
 - Professional Network
 - Role Models
 - Community



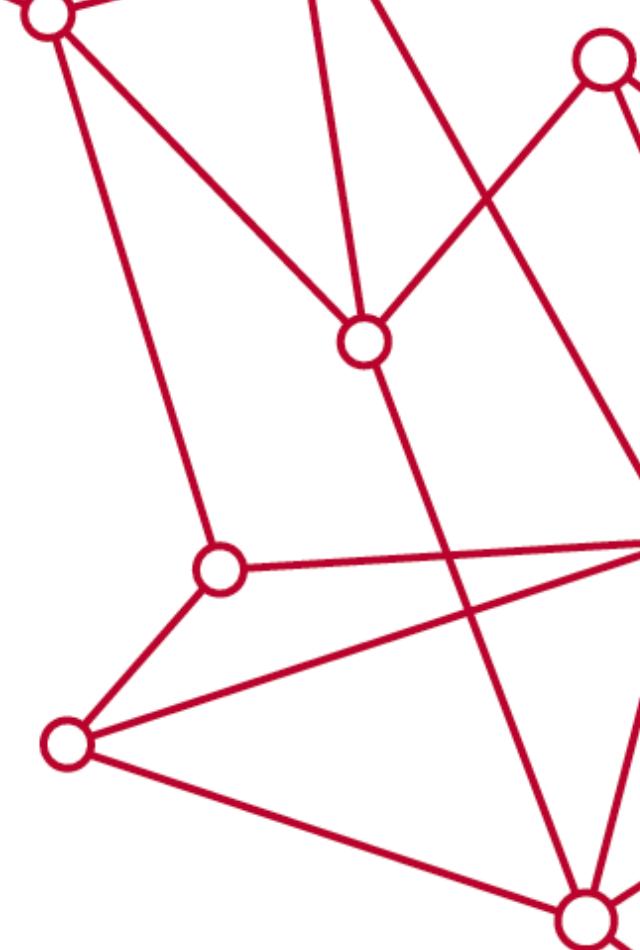
Invent The Future

One of ten summer programs around north America and the only one in Canada



Learn More: <http://ai-4-all.org/summer-programs>

Program In a Glance (Tentative)

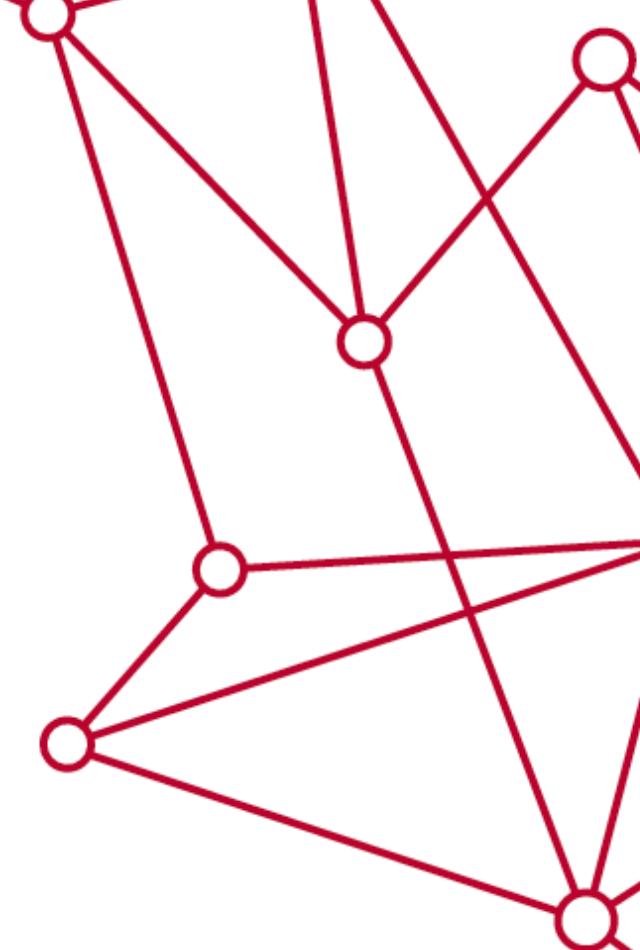


Set up	Set up	Set up	Set up	Set up
Program overview	Mon. review	Tues. review	Wed. review	Thurs. review
Introduction to Artificial Intelligence - Diana Cukierman	Someone from Bioinformatics / Biomedical Imaging / Robotics	Someone from Bioinformatics / Biomedical Imaging / Robotics	Natural Language Processing - Angel Chang	Computer Vision/Graphics - Manolis Savva
Break	Break	Break	Break	Break
Python Crash Course in Jupyter Notebooks				
Lunch	Lunch	Lunch	Lunch	Lunch
Personal Development	Machine Learning Basics			
Snack break	Snack break	Snack break	Snack break	Snack break
				Project Group Preferences
Lab tours	Social Activity	Social Activity	Social Activity	

Set up	Set up	Field Trip Day	Set up	
Projects Overview				
Project briefing in teams with Mentors	Mentor-led Project time		Mentor-led Project time	
Break	Break		Break	
Project times	Q&A with Dr. Fei Fei Li (Preparation for teleconference needed)		Data Sanity - Ouldooz	Presentations & Feedback
Lunch	Lunch: mentor mingle		Lunch	Lunch
Mentor-led Project time	Mentor-led Project time		Innovation & Pitch	Presentations & Feedback
Snack break	Snack break		Mentor-led Project time	
	Elevator Pitch Practice		Snack break	Public Event: Presentation Studio & Atrium, Flex Space and Boardroom would be useful for set up demos (open doors to atrium)
			Free time / Project time	

Mentors

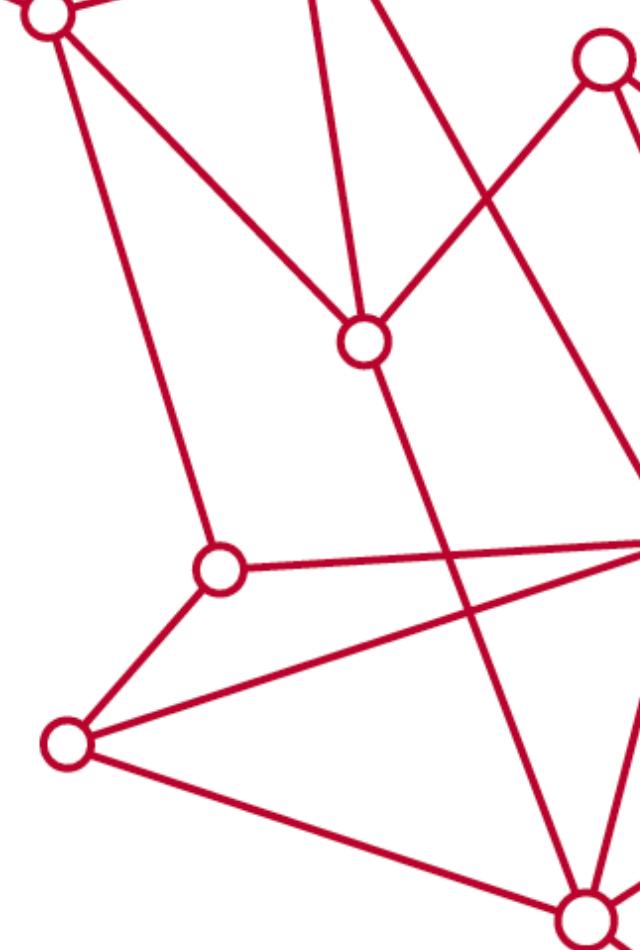
- Help define projects
- Prepare the project base & environment
- Help students implement the projects
- Foster new ideas and potential improvements
- Be role models



Welcome

- Instructor: **Steve**
- Program Mentors: **Neha & Trista**
- Robotics: **Sachini & Mahsa**
- NLP: **Pooya & Nishant**
- Computer Vision: **Liz & Yasaman**
- Bioinformatics: **Alice & Raquel**

An ITF alumni from 2018 will join each of the teams



Success Stories

- **Using AI to improve Surgery [Stanford 2015]**
 - Learned classifying and tracking surgical instruments in videos based on previous research
 - Improved on previous results by 28%
 - Explored adding tool movements and patterns to analyze surgical skill
 - Continued work turned to aware winning NIPS 2017 paper
- **Read more:** <http://ai-4-all.org/about/results>
 - Using AI to Build Community
 - Using AI to Improve the Criminal Justice System
 - Using AI to Increase Access to Emergency Care

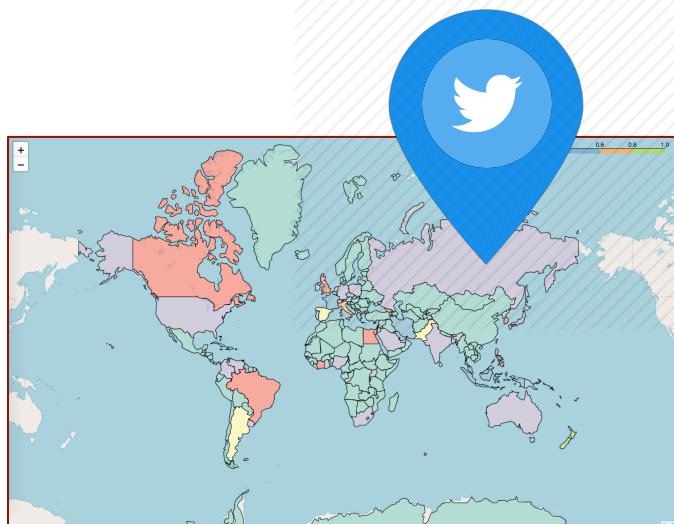


SFU ITF 2018



Projects from SFU ITF 2018

NLP: De-fake-news-anator

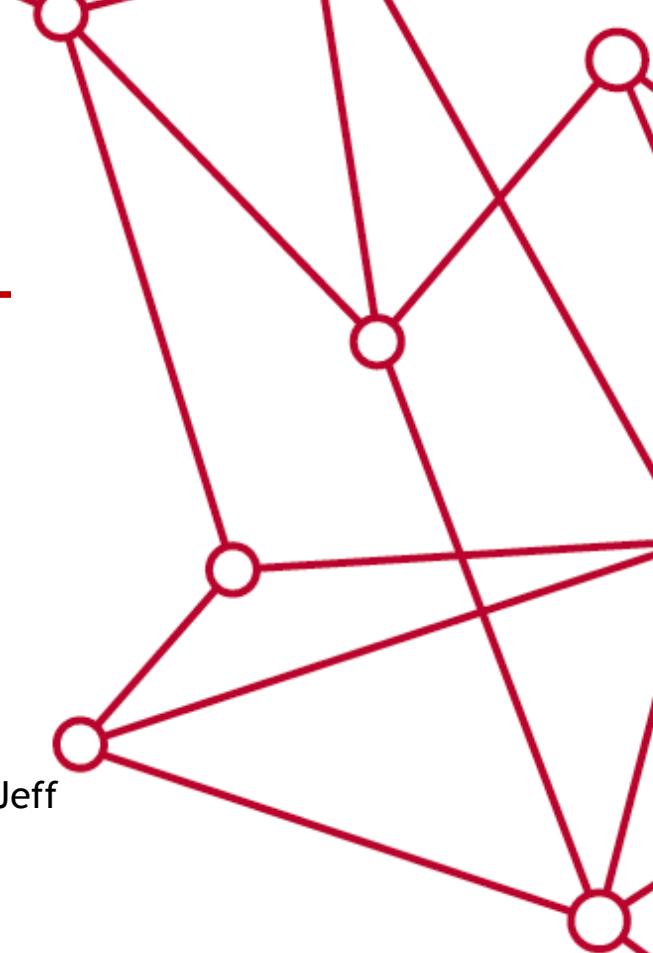


Public Opinion Profiling

- Are prominent societal figures perceived based on subjective or objective figures?
- Billionaires: Donald Trump, Elon Musk, Bill Gates, Jeff Bezos
- How: Tracking sentiment on twitter of the subjects

GeoTweet

- Quick visualization of public opinion
- Create maps with keyword search
- Challenges: Ambiguity in human language

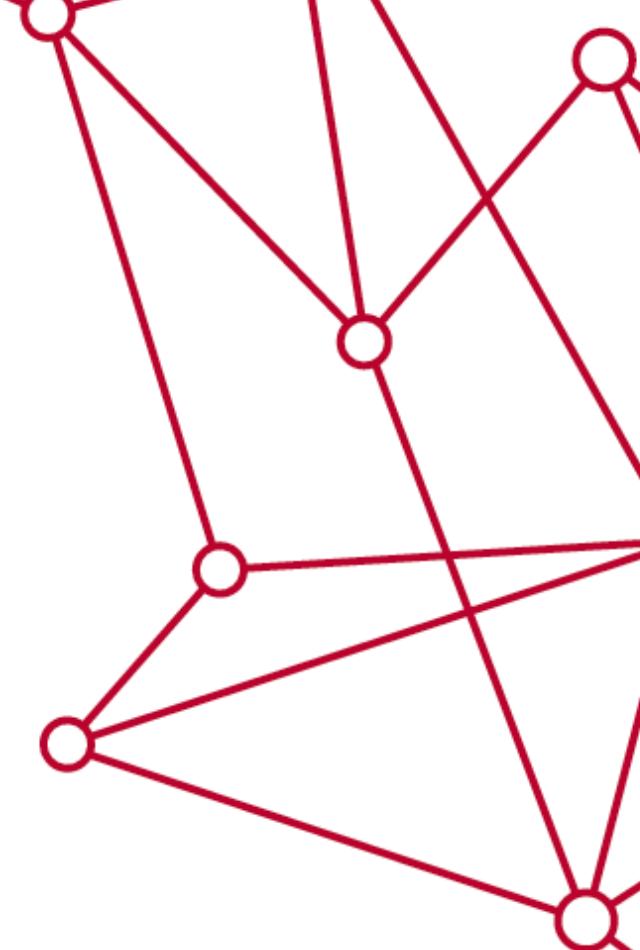


Projects from SFU ITF 2018

Robotics: Pepper for Wellbeing

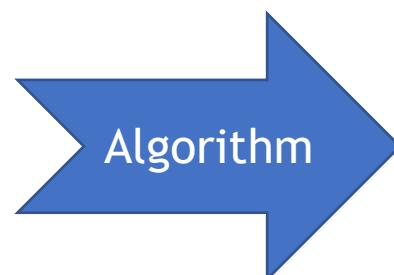


- **Conversational Companion**
 - Tells hilarious jokes
 - Gives trivia and quizzes
 - Has fun conversations
- **Health Companion**
 - Calls for help and calls 911
 - Provides tips based on the situation
 - Senses lack of presence and acts accordingly



Projects from SFU ITF 2018

Computer Vision: Food ingredients

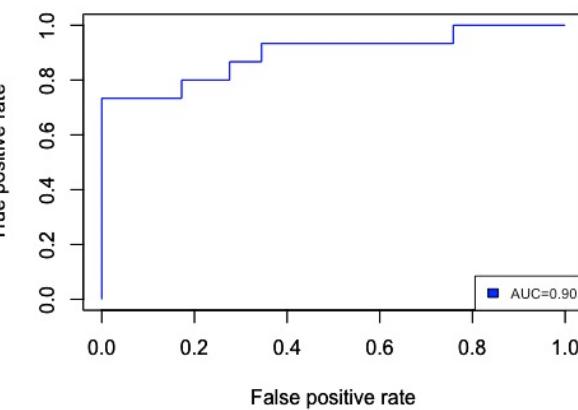
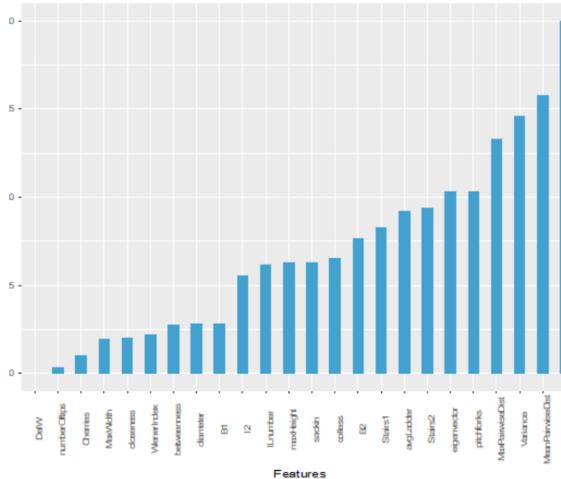
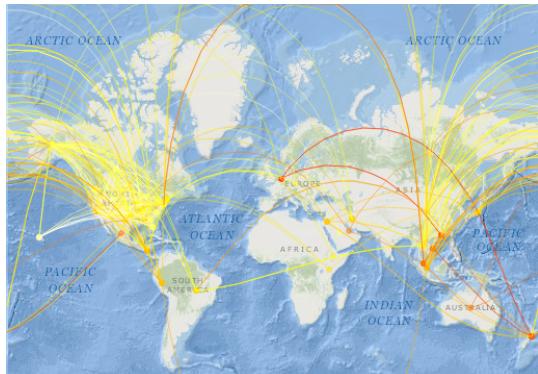


This is **bruschetta**.
*Calories: 120
Vegan: Maybe
Vegetarian
Contains Gluten*



Projects from SFU ITF 2018

Bioinformatics: Inferring the Infection Pathway of Influenza

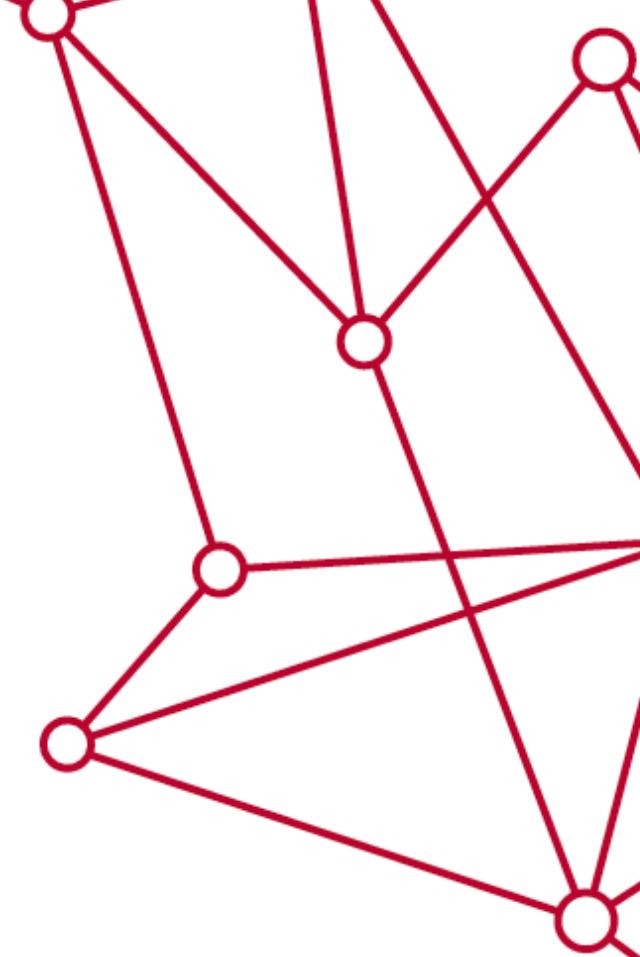


Map of Infection Pathways
red to yellow indicates ancestor to new strains

Predicting Future Strains

Important Dates

- **Initial Project Pitches:** May 17
- **Refined Project Pitches:** May 28
- **Project Code Ready:** June 28
- **Test Code on Program Laptops:** July 3 -10
- **Install Marathon:** July 10 -12
- **Program Dates :** July 15 - 26 (project team work on the second week)



Resources

- Jupyter Notebooks: <https://jupyter.org/>
- Kaggle. Ideas for datasets: <https://www.kaggle.com/datasets>
- Github : <https://github.com/ai4all-sfu/> (Please pass us your IDs for full access)
- Pitch document from last year:
<https://docs.google.com/document/d/1j3mGL1hvmSx8UoJLBcrSmPY0tRKWLRJP07kFO35dxZ8/edit>
- Example project requirements from 2018, to be collected from Project Mentors by Program Mentors
<https://docs.google.com/document/d/1B0FNKWQq38ylaO93WcmE4t9cnWt4goKVHzs3g8nUQj4/edit>
- Pitch document and code examples from AI4ALL
https://docs.google.com/document/d/1-Ed_QTiWyt3y6W55kQn2HsU8MZ9eaKRTZB4IdDA55Hc/edit
<https://github.com/abisee/sailors2017>

