Google Summer of Code Summit

Sergei V. Gleyzer, Enric Tejedor

GSoC Mentor Summit
October 28 - 30, 2016
Google Summer of Code

What is GSoC?

• Google-funded program for students to spend a summer developing open-source software
  – 12+ years
  – 12K+ students
  – 30M+ lines of code
  – 180+ Organizations
SFT in GSoC 2016

Webpage: SFT-GSoC

• 12 projects
  – 90 student proposals
  – 100s of student inquiries

• 12 mentors

• Admins:
  – Lorenzo and Sergei
Project Areas

• **Simulation**
  – Geant4 and GeantV
  – Sixtrack (particle tracking)
  – Blond (beam dynamics)

• **Data analysis tools**
  – Interactive ROOT Graphics
  – Machine Learning
    • *first time this year, significant student interest*

• **Other utilities:** cpypypy/cling
Final Presentations

GSoC16 Final Presentations Part 1

GSoC16 Final Presentations Part 2
GSoC Summit 2016

Where: Google Corners
When: October 28 - 30, 2016
Who:
  Organizations: 149
  GSoC mentors: 298
  Local GSoC program staff
Format: Event type: unconference
Fact: ~ 1/3 former GSoCs
Format

- **Unconference**
  - participant-driven event
  - Exchange of information and ideas
  - Create sessions around topics
    - Examples: Machine Learning in Computer Vision, Programming Languages, Outreach...
    - 50+ sessions/topics
      - Full schedule of sessions with notes
      - Administrative sessions for programs rules
GSOC Meeting Board

11:00-11:50
- Group Photo
- Lunch available 12:15-13:45
- Pitches
- T-shirts
- Snacks
- Coffee
- Breakout

12:00-12:15
- Group Photo
- Lunch available 12:15-13:45

14:00-14:50
- T-shirts
- Lunch available 12:15-13:45

15:00-15:50
- T-shirts
- Lunch available 12:15-13:45
- Snacks available starting at 15:00

Afternoon snacks available starting at 15:00

Lightning talks
Dinner available (18:30-20:00)
Lightning Round

• 30+ presentations from participants
  – 3 minute format
  – Introduction to the organization
  – 1-2 GSoC project highlights
    • Our presentation

• Great way to highlight the organization and work done by GSoC students
Highlights: Deep Learning

Powerful Machine Learning method based on Deep Neural Networks (DNN) that achieves significant performance improvement in classification tasks.

\[ u_1 = f(W_1x + \theta) \]
\[ u_2 = f(W_2u_1 + \theta_2) \]
\[ u_3 = f(W_3u_2 + \theta_3) \]
\[ u_4 = f(W_4u_4 + \theta_4) \]
Throughput Comparison

- **Throughput**
  - TMVA CPU
  - TMVA OpenCL
  - TMVA CUDA
  - Theano

- **Comparison**
  - Excellent throughput compared to Theano on same GPU

- **Throughput Values**
  - 2.7 * Theano

- **Precision**
  - Single precision
Classifier output: Neural networks, decision trees

Simple neural network
- Python function reads the network, converts to JSON; JS with d3js make the visualization from JSON
- Interactive: focusing connections, zooming, moving

Deep neural network
- HTML5 Canvas visualization (speed)
- Less interactive: zooming, moving

Decision trees
- Ipywidgets: input field for selecting the tree
- Visualization from JSON with D3js
- Interactive: closing subtree, showing the path, focusing, moving, zooming, reset
Program Statistics

Mentors

Students

Orgs

11/21/2016  GSoC 2016
Mentor Map

Mentors: 2524
Countries: 66
Average Age: 32
Oldest: 78 (never too late to become a GSoC mentor)
Student Stats

1206 Students
67 Countries
12% female (up from 2% in 2015)
85% passed

Our Student Stats:

6 countries: Greece 1, Hungary 1, India 4, Sweden 1, Russia 3, USA 2
1/12 (8%) female
10/12 (83%) passed
GSoC Statistics

Currently SFT has below average mentor/student ratio

~2 Mentors/Student

Mentors

Students
GSoC Program Changes

1) GSoC stipend amount will be adjusted by country of residence

- Same total budget
- Significant debate of pros and cons
  - Can support more students from Asia, South America, Africa
  - Equal pay for equal work?
  - Stipend not a salary - support while coding
Program Changes

2) Three payment installments instead of two
   – Some code must be produced before first payment
     • Combat elaborate fraud
   – GSoC Message:
     • Fail students early

3) Maximum of 2 repeat GSoC per student
   – 3-time GSoCs with same organization
SFT Umbrella

CERN-SFT is only HEP participant in GSoC

• HEP-wide expansion is possible
  – We already involve other mentors, but can be recognized for it, and create greater HEP involvement

• Discussed with GSoC program officers the idea of SFT becoming a GSoC umbrella organization
  – Other umbrellas: PSF, Apache, Open Genome…
  – Possibly via the HSF

• Organized a special session to gather experience

• Idea received positively, detailed discussions with GSoC on-going
SFT Umbrella

Possible Benefits:

• More mentors, students
• More HEP organizations involved
  – better visibility and clearer benefit to community
• For sub-organizations
  – individual recognition
  – less administrative overhead and restrictions of joining independently
  – benefit from SFT experience in the program
• Greater collaboration among HEP in software
GSoC 2017

Timeline:

• Jan 19 – Feb 9: Organizations apply
• Feb 27 Accepted: Orgs published
• Feb 27 – Mar 20: Students contact orgs
• Mar 20 – April 3: Student applications
• May 1: Proposals announced
• May 1 – May 30: Community bonding
• May 30: Coding begins
Student Tests

• Beneficial to test prospective students during the application period
  – Example: for TMVA machine-learning projects prospective students added a small feature (ROC curve)
    • Shows their ability and style
    • Weeds out applicants that are not serious
    • Good practice mentioned at GSoC
Administrative

Preparing an internal SFT GSoC Mentor Guideline for 2017

• Remove procedural “gray” areas
  – from idea to proposal to active GSoC project

• Please identify a co-mentor for your proposed projects
  – if you don’t have much time to dedicate to GSoC, please still sign-up, it helps the team
  – Proposals with multiple mentors will get more weight
Summary

• GSoc positively and measurably impacts our community
  – Developing developers
  – Program changes in 2017
    • Adjusted stipends, 3 payments, 2 repeat GSocs

• Exploring becoming an umbrella organization

• Start thinking about 2017 projects!
  – Contact us if already have ideas for next GSoc
  – Please consider becoming a mentor (if not already)
GSoC 16 Mentors

THANK YOU

J. Apostolakis
B. Bellenot
R. de Maria
A. Gheata
S. Gleyzer
W. Lavrivsen
S. Linev

L. Moneta
K. Sjobak
E. Tejedor
H. Timko
V. Vasilev
O. Zapata
The End