Google Summer of Code Experience

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Introduction

- Dmitry Emeliyanov and I ran a GSoC project in 2018
- A lot of work, but potentially significant rewards
- Free access to some very good computer science students

Introduction to Google Summer of Code

- Longstanding Google outreach project
  - A lot of work for the mentor (i.e. supervisor), but potentially significant rewards
  - Access to some very good computer science students
  - Students work remotely and are paid directly by Google (6000 USD for 2 months work, weighted by country)
  - Project must relate to an open-source codebase
- Google accept over 200 organisations each year
  - For HEP, CERN/HSF is our umbrella organisation
  - 26 completed projects in 2020

Our project:Faster Linear Algebra for ATLAS

Eigen is a fast, robust, open source linear algebra library, used by e.g. the Google Tensorflow and Large Survey Synoptic Telescope projects as well as ATLAS. Most algorithms in ATLAS software use symmetric matrices, which are unfortunately missing from Eigen. This would make our calculations more efficient: since the upper and lower triangular parts of the matrix are the same, only the upper/lower half of the matrix needs to be stored or used in operations.
Your task will be to implement an efficient symmetric matrix class storing only the needed parts. This will help ATLAS find particles while using less computing power and less storage space.

Creating a good project

- CERN benefits from name recognition and tends to get many applications
- Initially, we just asked for CVs and a covering letter - ended up with many applications of variable quality
- Shortly afterwards, we required applicants to submit a C++ project
- Probably between 1 and 4 hours of work
  - Could eliminate those who had submitted clearly non-compiling projects from consideration
- 50+ applications in total, one selected

Evaluation points

- First Evaluation (paid ≈July 1): 30%
- Second Evaluation (paid ≈July 29): 30%
- Final Evaluation (paid ≈September 5): 40%

If a student really isn't performing (e.g. hasn't joined meetings, answered emails, submitted code) then they can fail evaluation

Summary

- Compared to a traditional summer placement, more preparation in advance
- However, less supervision required over the summer - weekly/twice-weekly meetings, a few emails
- No employment admin
- Worthwhile as long as you have the time to work with and sift applicants in the spring