

RAL Activities on SWIFT-HEP

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People at RAL

- Particle Physics Department (PPD) personnel
 - ATLAS
 - Stewart Martin-Haugh
 - Jyoti Biswal (0.5 FTE)
 - Dmitry Emeliyanov
 - CMS
 - Claire Shepherd-Themistocleous
 - Alison Elliot (0.5 FTE)
 - Sam Harper
- Scientific Computing Department (SCD) personnel (WP1 activities)

RAL-Sussex summer activities

- Collaboration building discussions
 - Personal comment: As a newcomer, really useful to discuss things at a beginning level, such as environment setup and tools available
- Weekly meetings between Sussex and RAL: May → August
 - Sussex:
 - Alex Cerri, Lucy Lewitt, Mario Grandi, Stanislav Biryukov
 - RAL:
 - Alison Elliot, Stewart Martin-Haugh
- In-person discussion and training (Lucy, Alison, Alex) August 2022
 - Sitting in the same room together, making plans, and having code explained was **very** valuable.



RAL-Sussex topics

- Environmental setup: eg, using Vitis-HLS and Vivado
- Targeting different hardware platforms (eg, U50 vs U250)
- Implementing tracking algorithms using HLS
- Benchmarking with ATLAS tracking algorithm ([see Sussex talk](#))
- Plans for implementing part of a CMS tracking algorithm chain
- Discussed possibility of using a common FPGA card over the network in the future

ATLAS GPU Activities

- GPU activities with Stewart & Jyoti
 - Currently working with ATLAS HLT GPU prototype
 - Parts of ID tracking offloaded to GPU, CUDA
 - Throughput evaluation in multithreaded, multiprocess
 - How well can we fill the GPU with a relatively small amount of offloaded work?
 - After introductory work, plan to work more with tracc/ACTS
- Dmitry: tracking + GPU expert, extensive algorithm work
- Tim Adye involved in ACTS (common tracking software project)
 - Potential interesting future collaboration

CMS GPU Activities

- CMS HLT GPU work (as in the [talk by Sam](#) just prior)
 - T. Reis (RAL) currently maintaining ECAL GPU code
 - Interesting collaboration opportunity at RAL
 - Sam is ramping up involvement
 - Task definition and finding synergies
 - One potential interest is in compatibility layers such as oneAPI
 - Extensive experience with GPU support and problem solving

Meetings

- Discussed with Stewart, plan to start ~monthly meetings.
 - Could be useful as WP4-wide meetings
 - From personal experience, regular meetings have been extremely fruitful
- Graduate lectures have been held at RAL with some relevant training (FPGA, GPU, general computing, DAQ):
 - Link from this summer: <https://indico.stfc.ac.uk/event/461/timetable/#all>



backup