

CCPi Working Group Thursday May 7th 11:00-13:30

G59 Diamond House, Rutherford Appleton Laboratory &
Video Conference to University of Manchester ICAM.

Attendees - ICAM

- Prof Philip Withers – Chair (PW)
- Martin Turner (MT)
- Daniil Kazantsev (DK)
- Bill Lionheart (BL)
- Stefan Mairhofer (SM)
- Barry Searle (BS)
- Tom Rodgers (TR)

Attendees – G59

- Ron Fowler (RF)
- Srikanth Nagella (SN)
- Mark Basham (MB)
- Loic Courtois (LC)
- Graham Davis (GD)
- Kris Thielemans(KT)
- Evgueni Ovtchinnikov (EO)
- Winfried Kockelman (WK)
- Christoph Rau (CR)

Minute	Item	Action
7.05.01	The meeting began and the attendees introduced themselves	
7.05.02	<p>Agenda Item 1 - Actions from previous meeting</p> <p>COST events and meetings:</p> <p>DK is attending the Applied Inverse Problems conference at end of May and has organised a session there. SM reported that 2 people are planning to visit the Astra group.</p> <p>Visiting fellows: LC said that Brian Bay will be visiting later this year. LC may need help with CUDA development from CCPi; will contact SN in September.</p> <p>Ongoing action for suggestions for other visits.</p>	All
7.05.03	<p>Agenda Item 2 - Report on core support activities/plans</p> <p>MT presented the activities on developers days and other activities:</p> <ul style="list-style-type: none"> • Touchscreen day at Reading University was useful and will form sub-group (IVG – Interactive Visualisation Group) to promote touch screens for outreach, etc. 	

	<ul style="list-style-type: none"> • CCPi will be represented at the Cheltenham festival of science and will help at the “Dino zone” there. Any data would be helpful. • An extended Avizo framework developers meeting was held at Manchester hosted by Ali Chirazi. • Next developers’ day: will ask Warwick University Manufacturing group to host meeting. • Will hold a software show and tell on the frameworks for analysis at RAL over the summer. • ToScA 2015 will be in Manchester and 2016 will be in Bath. <p>Action: MT to arrange for Ajay Limaye to give another training session when he visits Manchester.</p> <p>Ongoing Action: MT to seek e-Science journal to publish reconstruction work.</p> <p>The idea of a joint meeting Neutron and X-ray methods was discussed along with “rich” tomography in general. KT noted that there would also be overlap with PET/MR methods in this area.</p> <p>BL is working on a grant proposal for rich tomography.</p> <p>Action: BL to ask Nicola Wadeson at Diamond to contact WK.</p> <p>MT reported that test data sets could now be made available on the zenodo website e.g. https://zenodo.org/record/16539#.VVXi8Jpk-RK</p> <p>The above is one of the example data sets Sophia Coban has uploaded to the site.</p> <p>Action: MT to ask Sophia to make available notes on how to upload data.</p> <p>RF reported on the work in quantification and the new Avizo algorithms contributed by Erwan Plougonven.</p> <p>Action: RF case study on beam hardening code.</p> <p>Action: RF/SN case study on quantification codes.</p> <p>Action: DK case study for flagship activities.</p> <p>EPSRC forms can be used for these.</p> <p>Action: MT/RF to report on the expanded CCPForge facilities.</p>	<p>MT</p> <p>MT</p> <p>BL/WK</p> <p>MT</p> <p>RF</p> <p>RF/SN</p> <p>DK</p> <p>MT/RF</p>
7.05.04	<p>Agenda Item 3 Training and teaching</p> <p>LC reported that the latest Avizo training session was completely full with 30 attendees.</p> <p>SN reported that Avizo will be giving an update on new developments in Avizo 9 at RAL next week.</p> <p>MT noted that Avizo site license expires at the end of March 2016; will need to investigate cost and requirements for new license.</p> <p>Action: MT/SN to contact CLF, ISIS, RCaH, DLS and SCD about interest in and cost of Avizo license.</p>	<p>MT/SN</p>
7.05.05	<p>Agenda Item 4 – Report on flagship grant (DK)</p>	

	<p>DK reported that 2 papers have been published and 2 more are in progress. Papers include one in Inverse Problems in Imaging and one on CUDA acceleration.</p> <p>PW said it would be good to be able to compare algorithms for restricted angle reconstruction.</p> <p>GD said he knew of a data set from a Nikon machine (for the Antikythera mechanism) with missing projections which can't be rescanned. It would be a useful test case.</p> <p>Action: GD to try and locate data for this.</p>	GD
7.05.06	<p>Agenda Item 5 – Framework reviews</p> <p>Diamond framework Savu: MB reported that progress had been slower than hoped but now had Nicola Wadeson and a new starter working on the project. MPI performance and other issues will be addressed and ring artefact codes may be added.</p> <p>ISIS IMAT framework: SN reported this was progressing well. There were issues with rendering large data sets (2000³) using just CPU methods so now looking to use GPUs. WK said that IMAT would begin operating in September so the framework needs to be working by then.</p> <p>Avizo framework (UoM): SN reported he was helping with a reader for BS reconstruction code within Avizo. PW noted the importance of segmentation and the sensitivity of simple methods to e.g. beam hardening, changes in machine parameters, etc. Should ask e.g. Avizo for better tools.</p> <p>Action: MT – arrange spring/summer talks on the 3 frameworks</p>	MT
7.05.07	<p>Agenda Item 6 – Test data sets</p> <p>Action: MT Set up zenodo community for CCPi test data sets. Give instructions for storing large files (>2GB) to MB, Russell Garwood.</p> <p>PW said should make clear which are full data sets and which are cut down for display, e.g. for CCPi-publicity.</p> <p>Action: MB to put data sets onto zenodo.</p>	MT MB
7.05.08	<p>Agenda item 7 Software licenses</p> <p>The Avizo license renewal had already been discussed.</p> <p>WK mentioned that Octopus (reconstruction) and VGStudio were already used in ISIS.</p> <p>LC had used VGStudio and found it similar to Avizo in functionality.</p> <p>KT raised the question of Open Source software licenses used for code produced by CCPi and CCP PET/MR and the issue of GPL versus Apache 2 type licenses. He favoured the latter as it allows commercial partners to make use of the software and would encourage more collaboration.</p>	

	<p>BL noted that code under GPL can be separately licensed to manufactures under another license, though this can be complex if multiple authors are involved.</p> <p>MB said that DAWN had more commercial interest when they moved away from GPL.</p> <p>KT said they would look at CCPi components like GPU reconstruction and discuss license issues with code owners.</p>	
7.05.09	<p>Agenda Item 8 - Phil Trans Journal status</p> <p>MT: The journal issue was released on Thursday. MT hopes to produce a poster of images from the journal.</p> <p>http://rsta.royalsocietypublishing.org/content/373/2043</p>	
7.05.10	<p>Agenda Item 9 – Visiting fellowships</p> <p>MT: Ajay Limaye and Brian Bay visits are planned. Others are encouraged. Ideally visitors to give seminars in two locations.</p> <p>Action: All. Suggestions for visitors.</p>	All
7.05.11	<p>Agenda Item 10 – Outreach</p> <p>MT: ToScA will have CCPi sponsorship. Should encourage people to attend.</p> <p>MT: Request for images to use at Time Cheltenham Science festival on the STFC/UoM stand.</p> <p>MT: STFC Open days at RAL 8th – 11th July will include a VIP day.</p> <p>Action: SN to coordinate CCPi representation for AVF at VIP Open Day.</p> <p>LC said that the RCaH would also be involved in the Open Day and would showcase CCPi work.</p> <p>SN asked for any interesting data sets that could be shown.</p> <p>MT said that Touch-table from DL may be used at RAL if suitable.</p>	SN
7.05.12	<p>Agenda Item 11 – EU Updates.</p> <p>EU COST proposals were discussed.</p> <p>KT noted that the PET/MR one is finishing shortly and cannot be renewed.</p> <p>MT noted should be involved in more COST actions.</p> <p>Action: MT/BL attend COST event in November (Antwerp).</p>	MT/BL
7.05.13	<p>Agenda Item 12 – CCP PET/MR and Electrical Tomography</p> <p>CCP PET/MR</p> <p>KT gave a brief overview of the new CCP PET/MR network.</p> <p>DK commented that he had experience of combined neutron and X-ray reconstruction which may be similar to the joint PET/MR work.</p> <p>BL suggested a joint workshop on level set methods.</p> <p>PW said it is important to apply for related EPSRC funding for research fellows.</p> <p>Electrical tomography</p> <p>TR gave a brief overview of electrical tomography methods from a user perspective.</p>	
7.05.14	<p>Agenda Item 13 – CCPi 5 year plan.</p> <p>MT discussed the CCPi 5 year plan for the period from the end of August.</p> <p>PW noted there should be two areas, the core funding work and the extra projects that could get funding.</p>	

	<p>BL mentioned 3 possible themes: (1) joint reconstruction, (2) rich tomography, (3) fast tomography.</p> <p>PW added robust segmentation and integrating analysis with reconstruction. Need to start writing proposals. The frameworks to implement algorithms are also crucial. MB said that DLS may be able to support work on code integration.</p> <p>PW noted that over the next 9 months both CCPs should be looking to make bids for further EPSRC funding, such as Software for the future calls.</p> <p>PW suggested a workshop on segmentation techniques. Action: PW to contact Russell Garwood and others who may be interested about this.</p>			PW
7.05.15	<p>Agenda Item 11 – AOB PW asked if anyone wanted to be on the EPSRC E-infrastructure Strategic Advisory Team (SAT).</p>			
Minute	Action	Person Responsible	Date due to be completed by	
7.05.02	Visiting fellows suggestions	All	Ongoing	
7.05.03	Arrange for Ajay Limaye to give training session	MT		
	Seek e-Science journal for reconstruction work.	MT		
	Ask Nicola Wadeson at Diamond to talk to WK about possible collaboration	BL		
	Ask Sophia to make available notes on how to upload large data to zenodo.	MT		
	Case study on beam hardening code.	RF		
	Case study on quantification codes	RF/SN		
	Case study for flagship activities	DK		
	Report on the expanded CCPForge facilities	MT/RF		
7.05.04	Contact CLF, ISIS, RCaH, DLS and SCD about interest in and cost of Avizo license	MT/SN		
7.05.05	Try to locate data with missing projects for Antikythera mechanism	GD		
7.05.06	Arrange spring/summer talks on Savu, IMAT and Avizo frameworks	MT		
7.05.07	Set up zenodo community for CCPi test data sets	MT		
	Place test data sets on zenodo	MB		
7.05.11	Coordinate CCPi representation in Atlas Visualisation facility for STFC Open Day.	SN		
7.05.12	Attend COST event in November (Antwerp)	MT/BL		
7.05.14	Contact Russell Garwood about segmentation workshop.	PW		

Appendix: Developers' Day held on Tuesday 28 April - 11am-4pm in University of Manchester (11 present - including Skype). This is a list of actions after the group gave descriptions of current code integration/timings and various descriptions of dataflow systems (savu@Diamond, IMAT and Manchester's Avizo integrated framework):

Present: Barry Searle, Philip Withers, Daniil Kazantsev, Hamid Dehghani, Christopher Egan, Sophia Coban, Tristan Lowe, Ali Chirazi, Bill Lionheart, Neil O'Brien, Martin Turner

List of actions:

== Helical data sets etc.

1. BL with AC (Ali Chirazi): Create a simplified helical scan - i.e. circle and line on the Zeiss and/or Nikon Xtek machine within the Henry Mosely Xray Facility - using for example Sophia's beads sample (possibly scaled in size).

2. BL when on visit to Zeiss to inquire if their helical datasets can be made publicly available - can they be released on <https://zenodo.org/communities/>

2.5 MT to setup a new zenodo community page for shared data sets: see initial link below.

== Limited Angle service

3. AC to setup programming/scripts for Nikon system for Limited Angle capture.

4. BS with AC to install current version of reconstruction software and

5. ... BS (with SN) to add interface within Avizo for selecting reconstruction algorithm.

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6. DK with BS (and NW) check the CCPForge code has all three versions; for limited angle reconstruction.

7. ... installed on large-memory Henry Mosely's Dell Visualisation machine and linked to Nikon within Avizo: to create a comparison chart (see 2 above).

8. AC with TL to talk to Nikon regarding Data scripting for longer term machine changes.

== Phantoms

9. Phantoms were discussed. Spheres / plates and an upcoming BSI standard. MT to find out BSI standard and report back.

== License

10 GPL license agreed on reconstruction code and made open source - BS (link with SN and EO) to implement on CCPForge

== RICH tomography

11. BL proposed a global EPSRC proposal - for all 'hyperspectral' needs, e.g. xray absorption and diffusion. Liaise with CE's needs (and BC) concerning the paper presented and then links to IMAT beamline at ISIS (winfried.kockelmann@stfc.ac.uk, joe.kelleher@stfc.ac.uk)

12. CE to meet with SN/BS and go through CCP software repositories etc.

== Segmentation

13. Workshop on segmentation. SC and BL to invite Oliver Dorn to local segmentation / level sets workshop and EPSRC bid

== Training

14 Training courses

HD to link with BL - regarding different levels of training - possible at early stage.

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Pointers/Links:

- Sophia's dataset is linked at:

<http://tyne.dl.ac.uk/twiki/bin/view/Visualisation/ProjectsCCPDataSets>

- New Royal Society issue due next week - prematerial here:

<http://rsta.royalsocietypublishing.org/content/x-ray-tomographic-reconstruction-materials-science>

- 1 - 7 June 2015 Times Cheltenham Science Festival:

Material request for volume vis on the touchtable (preference is dinosaur related) email martin.turner@manchester.ac.uk

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