

## CCPi Working Group Meeting - Thursday November 26<sup>th</sup> 13:00-16:30

Atlas Visualisation Facility, Rutherford Appleton Laboratory plus Video Conference links.

Attendees – in person:

- Martin Turner (MT)
- Daniil Kazantsev (DK)
- Peter Lee (PL)
- Graham Davis (GD)
- Martyn Winn (MW)
- Paul Quinn (PQ)
- Aaron Parsons (AP)
- Stefan Mairhofer (SM)
- Robert Atwood (RA)
- Genovera Burca (GB)
- Nicola Wadeson (NW)
- Mark Basham (MB)
- Thomas Blumensath (TB)
- Ron Fowler (RF)
- Srikanth Nagella (SN)
- Evgueni Ovtchinnikov (EO)

Attendees – Remote VC links

- Philip Withers (PW)
- Kris Thielemans(KT)
- Bill Lionheart (BL)

Minute	Item	Action
26.11.00	The meeting began and the attendees introduced themselves	
26.11.01	<p>Agenda Item 1 - Framework reviews</p> <ul style="list-style-type: none"><li>• <b>Savu (DLS) – Nicola Wadeson</b> The DLS Savu python framework for image reconstruction was presented. The pipeline architecture allows high throughput data analysis.</li><li>• <b>IMAT (ISIS) - Genovera Burca</b> The new IMAT instrument at ISIS was reviewed. Both neutron tomography and diffraction will be possible on large samples. For software analysis ImageJ, Mantid, VG Studio, Avizo and ParaView are being considered. The Ultra2 project with SCD is based on ParaView.</li><li>• <b>Electron and Soft X-ray tomography – Martin Winn</b> The CCP-EM project in Electron cryo-Microscopy was described. The original funding from 2012-16 has been extended to 2021.</li></ul>	

	<p>The project has a biological bias and employs two staff in the RCaH (Harwell). Expect to move into electron tomography in the future with a new beam line B24 and Electron Microscopes at DLS. IMOD software from University of Colorado used for segmentation of results.</p> <p>MT noted that CCP5 and others were also interested in quantification that works across different scales and that a workshop on quantification/segmentation is desirable. PL commented that segmentation is considered a quantification technique within the CT imaging community.</p> <ul style="list-style-type: none"> <li>• <b>I14 Hard X-ray Nanoprobe – Paul Quinn</b> The new I14 beam line at DLS was described. This is expected to be ready by March 2016. Techniques such as X-ray fluorescence tomography will be used which can be very slow and would benefit from iterative reconstruction using a limited set of projections.</li> </ul> <p>MT noted that multimodal reconstruction (as in CCP PET-MR for example) may be useful for the data from I14.</p> <ul style="list-style-type: none"> <li>• <b>Avizo reconstruction tools – Sri Nagella</b> The CCPi reconstruction and quantification codes are now available in several visualisation packages including modules for Avizo. A NeXuS file reader is also available for the DLS data format. The Avizo modules have recently been installed on University of Manchester machines.</li> </ul> <p>MT thanked the presenters and said the CCPi wants to encourage collaboration and joint workshops across these subject areas. The next CCPi developer’s meeting will be held in Warwick University on the 10<sup>th</sup> Dec.</p>	
26.11.02	<p>Agenda Item 2 – Actions from previous meeting</p> <ul style="list-style-type: none"> <li>• Visiting fellowships: MT reported that there had been 4 visits since the last meeting. More suggestions are welcome. For short visits approval may be given by email. For longer visits, e.g. 3-4 weeks, a more detailed application is required. MT to invite author of Tomviz to visit. Ongoing action for visiting fellow suggestions (ALL).</li> <li>• Ajay Limaye gave a training session on Drishti before the Manchester ToScA meeting (complete).</li> <li>• Seek e-Science journal for reconstruction work (ongoing)</li> <li>• Ask Nicola Wadeson at Diamond to talk to WK about possible collaboration (complete).</li> <li>• Sophia beads data on Zenodo(complete). Encourage people to add data sets on Zenodo. Advantage of long term support from CERN and DOI for publications.</li> <li>• Case studies are ongoing. DK reported that he passed on</li> </ul>	<p>MT ALL</p> <p>MT</p> <p>ALL</p>

	<p>reconstruction codes to Barry Searle and was now working on a new project for PL.</p> <ul style="list-style-type: none"> <li>• Presentation on enhanced CCP Forge facilities to CCP PET-MR is being arranged; will do one for CCPi (ongoing).</li> <li>• New 3 year Avizo license agreement for DLS/RCaH/ISIS is in progress. DLS also intend to purchase an Avizo-to-go license. (ongoing)</li> <li>• GD reported that the Antikythera mechanism, which was scanned at a museum in Greece, is a notable artefact and the scan data suffers from some missing projections. If anyone is interested in re-analysis of the data he is happy to act as a go-between.</li> <li>• Talks on Savu , IMAT and Avizo frameworks delayed, partly due to ToScA. Several companies are also keen to give presentations. (ongoing).</li> <li>• Zenodo CCPi community site is online (done).</li> <li>• Mark Basham to add data sets to Zenodo site (On going)</li> <li>• STFC Open day was well attended (done).</li> <li>• MT reported on COST event in Antwerp. Action: they have some money for collaborations and visits between sites to spend over next 18 months. (complete)</li> <li>• Segmentation workshop: ongoing.</li> </ul>	<p>RF/SN/MT</p> <p>MT/RF</p> <p>MT</p> <p>MB</p> <p>PW</p>
26.11.03	<p>Agenda Item 3 Report on Core Activities</p> <p>MT gave a brief report on the core activities for CCPi. These included:</p> <ul style="list-style-type: none"> <li>• Software development: <ul style="list-style-type: none"> <li>○ Work on the Savu framework (SN)</li> <li>○ ULTRA2 project with ISIS (SN)</li> <li>○ Reconstruction codes now available in CCPi modules for Avizo/ParaView/ImageJ (SN)</li> <li>○ Further development of the Beam Hardening correction software with LC and Matthew Pankhurst (RF)</li> </ul> </li> <li>• Development of the CCPi 5 year plan</li> <li>• CCPi website re-development using Drupal. The new web site is now on line and is significantly enhanced over the old site. The Drupal framework allows the site to be updated more regularly.</li> </ul>	
26.11.04	<p>Agenda Item 4 – Teaching and Training</p> <p>MT reported that 10 courses and training events had been held in the period. Policy has been that any CCPi member should be able to attend training events at other sites free of charge. Hope to continue this.</p>	
26.11.05	<p>Agenda Item 5 – Test data sets</p> <p>MT discussed test data sets for CCPi. Would like a set on open source data sets covering areas. MT will be placing some of his data on the Zenodo site. It is important that test data sets are “finalised” so that a meaningful DOI can be associated with them. Action: MT to place data sets on Zenodo</p>	<p>MT</p>

26.11.06	<p>Agenda Item 6 – Software licenses</p> <ul style="list-style-type: none"> <li>• Kate Dobson is investigating the possibility of a CHEST agreement for academic licensing for Avizo.</li> <li>• STFC/DLS Avizo license agreement is progressing.</li> </ul>	
26.11.07	<p>Agenda item 7 Phil Trans Journal Issue #2</p> <p>MT said that Manuchehr Soleimani was keen that CCPi be involved in another special issue of Phil Trans. A focus of quantification rather than reconstruction seemed appropriate. A volunteer to edit the issue would be needed. Action: Suggestions for papers; volunteer for editor (ALL)</p>	ALL
26.11.08	<p>Agenda Item 8 – Visiting fellows</p> <p>MT reported there had/will been visits from:</p> <ul style="list-style-type: none"> <li>• Jakob Sauer Jørgensen (6 months – in RAL Jan 2016)</li> <li>• Antonio Pop (visit to RAL – EPSRC case study for DLS)</li> <li>• Support for Russell Garwood (new machine in ICAL)</li> </ul>	
26.11.09	<p>Agenda Item 9 – Outreach and Website</p> <ul style="list-style-type: none"> <li>• MT reported the new Drupal website has replaced the existing site at www.ccp.i.ac.uk. The improved website will be easier to update and maintain.</li> <li>• CCPi main e-mail list now has about 350 subscribers.</li> <li>• The new Interactive Visualisation subGroup is exploring touch table technology.</li> <li>• The Cheltenham Science festival CCPi presence was very well attended and the touch screen display was popular.</li> <li>• RAL Open Days were very well attended.</li> <li>• EMiT conference was held in Manchester</li> <li>• Last ToScA conference had about 120 attendees with training sessions (over a full day) beforehand. 2016 planned for Bath and 2017 could be at Diamond Light Source.</li> </ul>	
26.11.10	<p>Agenda Item 10 – EU Updates</p> <p>MT reported that upcoming COST events will be advertised on the CCPi website where possible. Events include Quantitative 3D X-ray Imaging (Leiden) and Big Data/Computation for Tomography (Szeqed) in January and Astra toolbox training in April.</p> <p>Funds for visits are also available, particularly for theoretical/practical collaboration.</p>	
26.11.11	<p>Agenda Item 11 – 5 year plan</p> <p>The CCPi 5 year plan was discussed. MT reported that BL was keen for this to include methods such as joint reconstruction, rich and fast tomography.</p> <p>KT said that CCP PET-MR had similar goals, and this was a good way</p>	

	<p>forward. However it is difficult and needs consistency checks to avoid erroneous results.</p> <p>BL has a new grant on electrical impedance tomography which uses these techniques.</p>	
26.11.12	<p>Agenda Item 12 – Workshops and connections</p> <p>MT said that a synergistic workshop on joint reconstruction is planned with CCP PET-MR.</p> <p>CCP5 and CCP-EM are interested in multiscale tomography and quantification which could be an area for collaboration.</p> <p>MT asked for other suggestions for workshops.</p> <p>Action: email ideas for workshops to MT.</p> <p>KT gave an update on developments within the related CCP PET-MR project. The PET and MR image reconstruction methods are very different and are being addressed using the Open Source packages STiR and Gadgetron, though others may be used in the future. Four software framework meetings have been held to gather input from the community. An Open Source reconstruction workshop was held at MIC 2015 which had interesting presentations on Astra, Occiput, CASTOR, ODL and Gadgetron. This was useful, though it is hard to get people to work together.</p> <p>KT also mentioned the joint workshop on reconstruction methods that BL has suggested. Expect this to happen early next year.</p>	All
26.11.13	<p>Agenda Item 13 – Working group membership</p> <p>MT suggested Ceri Brenner or Ric Allott from CLF be asked to join the CCPi working group to represent CLF at RAL.</p> <p>Action MT</p>	MT
26.11.14	<p>Agenda Item 14 – Industry links</p> <p>MT reported that the third Xradia European Network Workshop was held in Manchester on 4-5 November.</p> <p>PW said there 60-70 attendees.</p> <p>MT also mentioned the EU-COST InTo event (4-5 Nov) and the industrial exhibitors at ToScA.</p> <p>PW noted that CCPi needs to create more industry links.</p>	
26.11.15	<p>Agenda Item 15 – Show and tell events</p> <p>MT reported a total of 27 events so far. The latest was on the Open Source Dream.3D software. A recording of this presentation is now available and future presentations will be recorded where possible.</p>	
26.11.16	<p>Agenda Item 16 – Events</p> <p>MT reported that he attend part of the Maple Compressive sensing workshop at UoM.</p>	

	GD talked about the 2016 SPIE tomography conference in San Diego, 28 <sup>th</sup> Aug-1 <sup>st</sup> Sept. This conference is expensive but has very high impact within tomography. This year's conference is 3 days long and the call for abstracts is already out. GD is on the program committee and may be able to help with invited speakers; contact GD if interested.		
26.11.17	Agenda Item 17 – AOB  MT noted that upcoming reports will be required for CCPi and internally to STFC on the CCPi work. There are official targets in the CCPi work plan that need to be met. Action MT	MT	
<b>Minute</b>	<b>Action</b>	<b>Person Responsible</b>	<b>Date due to be completed by</b>
26.11.02	MT to invite author of Tomviz to visit	MT	
	Visiting fellows suggestions	All	Ongoing
	Seek e-Science journal for reconstruction work.	MT	Ongoing
	Arrange talks on Savu , IMAT and Avizo frameworks	MT	Ongoing
	Mark Basham to add data sets to Zenodo site	MB	
	Encourage people to add data sets to Zenodo.	ALL	
	Case studies on beam hardening, quantification	RF/SN/MT	Ongoing
	Report on the expanded CCPForge facilities	MT/RF	Ongoing
	Contact Russell Garwood about segmentation workshop.	PW	Ongoing
26.11.05	MT to place data sets on Zenodo	MT	
26.11.07	Suggestions for papers for quantification Phil Trans journal issue. Volunteer for editor,	ALL	
26.11.12	Send ideas for future workshops to MT	ALL	
26.11.13	MT to ask Ceri Brenner or Ric Allott to join the CCPi working group	MT	
26.11.17	Submit internal CCPi reports to STFC/EPSRC	MT	