Minutes of CCPI Management Meeting November 26 2012, DL/RAL/Southampton VC

Attendees

Phil Withers (CCPI Chair), University of Manchester (PW)
Bill Lionheart, University of Manchester (BL)
Martin Turner, University of Manchester (MT)
Barry Searle, STFC (BS)

David Worth, STFC (DW)
Mark Basham, DLS (MB)
Christoph Rau, DLS (CR)
Rob Atwood, DLS (RA)
Daniil Kazantsev, RC@H (DK) - EPSRC Fellow in Iterative Reconstruction
Peter Lee, University of Manchester RC@H (PL)
Richard Green, RC@H (RG)
Andrew Ramsey, Nikon Metrology (AR)

Richard Boardman, University of Southampton (RB)
Thomas Blumensath, University of Southampton (TB)

Apologies

Mark Williams, University of Warwick
Alison Davenport, University of Birmingham
Ian Sinclair, University of Southampton
Graham Davis, Queen Mary University London

Review of minutes from 19/07/12 meeting

Suggested membership interest groups to create
- Quantification (DW)
- Image Reconstruction (BS/BL/Manuchehr Soleimani)
- Image based modelling, Lee Margetts may already have or should be involved with this.
- Instrumentation (RA/AR)

Instrumentation may overlap list run by Graham Davis and there may also be interest in this group from ISIS.

A possible group for the future suggested by MT is data movement.

Action BS: Mail membership to ask which subgroups they would want to join.
Action RA, CR: Check list with Graham Davis, interest of ISIS
Action BS, DW, RA, ?: Setup lists

Codeathon - No date set so far.
Action BL: Set meeting date in Dec/Jan

Compressed sensing fellow - TB in post, a few contractual issues remain.

Promotional Materials

Agreed 1.25k to joint fund video of experiment at Diamond 7-10 Dec. Phil Manning is a likely source of a second video, probably a dinosaur.

Action PW: Promotional materials from Phil Manning.

Training Materials from Bath need to be available for mid-term review target, no information on required budget provided so far.
Action Bath: ongoing, produce budget and develop training materials for March.

Reports

Barry Searle

 User interface work on CGLS, code has been committed to CCPForge. Routines used by the total variation regularisation routines that are common with CGLS have been integrated into the C code. Work is on-going on optimising the projection/back-projection algorithms. Asked for a reference Filtered Back Projection code to include.
Action BS: Get copy of FBP code used at Diamond from RA

David Worth

Four algorithms so far added - principle component analysis, accessible pore volume, connected component labelling and ellipsoid fitting. Available on CCPForge. Next algorithm will be either a 3D Navier-Stokes flow code or particle tracking.
10 participants at workshop in early Nov, included tutorials on segmentation use with RG. Worked examples could also be created for online use.
Action DW: Email availability of algorithms to JISC list
Action DW, RG: Create worked examples

Need for Research Meetings as well as training workshops in targets -

There was a recent discussion on new Diamond beam lines. DW mentioned idea from PL for quantification workshop where participants present their results, algorithms or problems needing solutions.

Action DW, BL: Joint MIRAN/CCPI quantification workshop for Feb 2013

MT mentioned intention of HIP to run in image based modelling events at DL and RAL with training plus show and tell. CCPI may also sponsor the event.

Daniil Kazantsev

PDRA on flagship grant started in Nov. Went to Manchester MIRAN course.
Action DK, BS: arrange visit to Bath.

Thomas Blumensath

Aim is to bridge gap to real apps. Compressed sensing theory is well established with others also working on it, e.g. Paul Midgely (Cambridge) in electron microscopy, recent EPSRC fellow at UCL.
Action TB: presentation of project results at next meeting.

Visitor Programme

Can use up MIRAN budget for Manchester visits till March and save CCPI budget for other sites and dates after this.
Discussions are in progress on a visiting fellow from VSG at Manchester. HIP is also considering possible visitors.
Action BS: resend visitor programme invitation to JISC member list

Promotional Materials

Progress needs to be made on Bath training materials for March.
Videos - possible capture of lab experiment to complement planned SR example from Diamond. Comparison may help users decide which is appropriate for them.
Animation could be done Dr. Ajay Limaye of the Australian Supercomputer Facility.
Results need to be on web by March.
Action MT, BS: Follow up with Bath
Action RA: Check animation with Ajay

Mid-term targets

Active members

Member list is big enough, email on interest groups should provide more detail on active members (target is > 50).

International Fellows

Joint MIRAN visitors are the main activity so far.

Industry links

Should be sufficient company links on member list, but none have so far participated in workshops. VSG visit would also be relevant. Need some industrialists at proposed Feb workshop.

Workshops

20 participants so far, need another 20+ at next (Feb) workshop.

Outreach

Videos and training material already discussed.

Software

Iterative reconstruction tools look ok and analysis routines look to be on target.

Possible centre of rotation or image registration algorithms available from Valery(?)

Missing wedge is really just a limited angle projection for which the iterative reconstruction algorithms should be better. Other case is a full rotation but with a limited number of projections. Some limited data algorithms available from David Szotten's thesis.

Action BL: Investigate centre of rotation availability.
Action BS, BL: Check availability of limited data code from thesis

Papers

Target is 3, possible publication on quantification algorithms (PL/DW)

Parallel funding

TB compressed sensing fellow. Also European COST network funded which can joint sponsor events with CCPI and provide funds for EU participants.

AOB

Submission into EPSRC software for the future call is due 4 December. Software framework for whole process of data capture and storage, image reconstruction and through to image based modelling. Preliminary request for Hartree Centre support already submitted. Includes Manchester, Southampton and STFC

PBRet(?) phase retrieval algorithms and possible visualisation software workshop including paraview mentioned by RA.

Gathering of UK users of volume visualisation to discuss practical solutions may be organised by HIP.

HIP is investing in a room in the Atlas building with a visualisation screen and will have some large memory workstations that Diamond users who have finished their experiment but not yet left the site could use. They are also interested in attempting to better manage the pool of Avizo tokens that they and Diamond will have. There are issues with sharing licenses that are owned by different organisations on the same site though.

Discussion of DW segmentation algorithms and need to support both small groups using open source solutions (e.g. volview) and larger groups with commercial solutions. 3D slicer which reads dicom files and is vtk/itk based like volview is used by various medical groups.

Request by Adrian Wander for suggestions on how to link Hartree activities to the CCPs.

Industry needs from AR is for way to handle materials with components of very different densities (e.g. binary plastic/metal). Current image reconstruction uses single material beam hardening corrections. Can probably provide examples of problematic data sets. May relate to Sophia Coban's research.

Long term storage of raw and processed data was discussed. The requirements are similar to that of a library. The intention is to have a doi assigned to the public Diamond data set to be collected in December. Currently data collected on Diamond is open access to anyone with an STFC federal id once it has been archived. Question of what form of compression would help to reduce the size.

Provisional date for next meeting is 8th May 2013, possibly another DL/RAL VC.