Report of the fourth CCP PETMR hackathon

Logistics

Date: 23-24 September 2019

Location: University of Bath

Attendees: Richard Brown (UCL), Evgueni Ovtchinnikov (STFC), Kris Thielemans (UCL), Edoardo Pasca (STFC), Matthias Ehrhardt (Bath), Evelina Ametova (Manchester), Evangelos Papoutsellis (Manchester), Palak Wadhwa (Leeds), Daniel Deidda (NPL)

Aims

Preparation for synergistic symposium

Topics

Group 1 Matthias, Evangelos, Edoardo

The aim of this group was to try to reconstruct PET dataset with CIL algorithm. The FISTA algorithm has been used. Although in CIL there is no concept of Objective function per se, there are Functions that are used by algorithms to construct their specific objective function.

It is possible to use SIRF's Objective Function (PoissonLogLikelihoodWithLinearModelForMeanAndProjData) which provide methods for evaluation at certain solution and to calculate the gradient. However it was found that SIRF's (or better STIR) objective function returns the negative gradient wrt CIL.

We propose to change the gradient sign (and the call sign which appears to be inverted as well) wrt to the conventions in STIR. Matthias points out that in the MR and optimisation communities it is convention that algorithms do minimise.

An issue https://github.com/CCPPETMR/SIRF/issues/442 has been opened for discussion.

Group 2 Edoardo

Finalise the PR add_cil in SIRF-SuperBuild. Struggling with astra-toolbox external project Edoardo did eventually produce a correctly working External_astra-toolbox.cmake file.

Further polishing on travis was carried out by Casper and Edoardo. Latest travis build is successful on Linux. Further errors are present on OSX and docker builds. https://travis-ci.org/CCPPETMR/SIRF-SuperBuild/builds/592485753

Group 3 Daniel, Palak (day 2)

The aim was to use Hybrid Kernel algorithm from STIR

Group 4 Richard

Group 5 Evelina