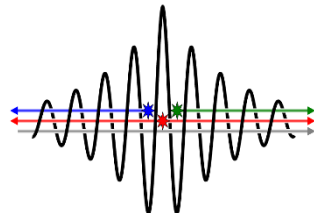


PETRIC Award ceremony

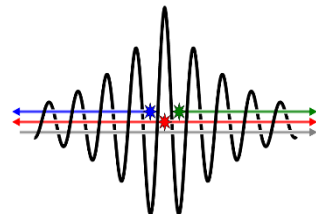
Participation

- 7 teams registered
- 4 teams submitted
- 9 algorithms (3+3+2+1)



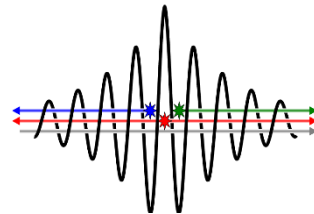
Outcomes

- Sample OSS implementations of fast MAP reconstruction algorithms, together with open evaluation
- Improved STIR/SIRF/CIL
- Scripts for data-validation etc for automatic processing
- Docker images
- Curated phantom data collection
- OSS framework for running future challenges



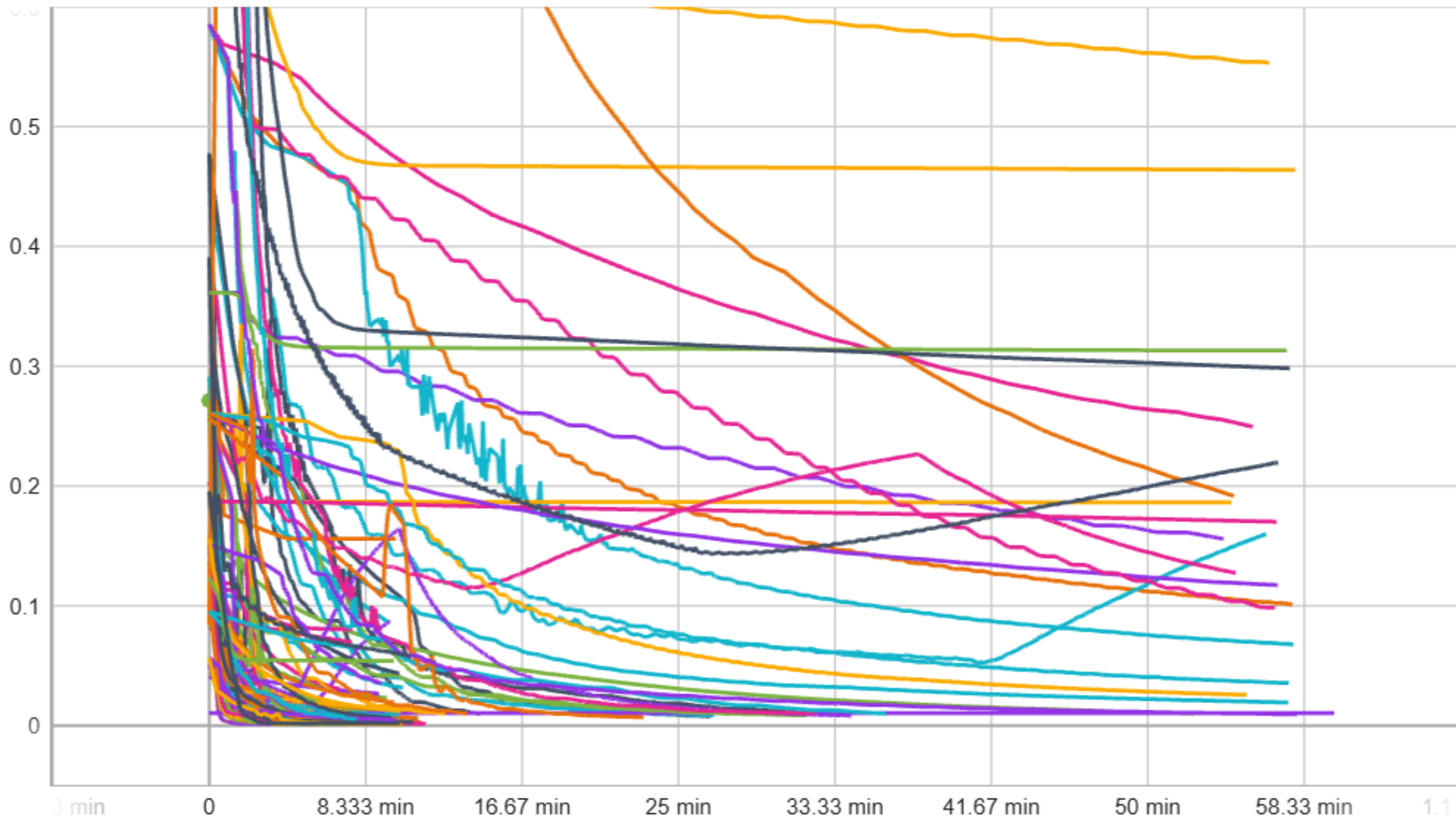
Challenges encountered

- Bugs uncovered due to wide range of data and algorithms
- Reference algorithm (to find the converged solution) turned out to be very slow
- Getting sufficient data, adapting converts
- Computational resources
 - 2 GPUs burnt
 - Cloud down for maintenance
- Human resources



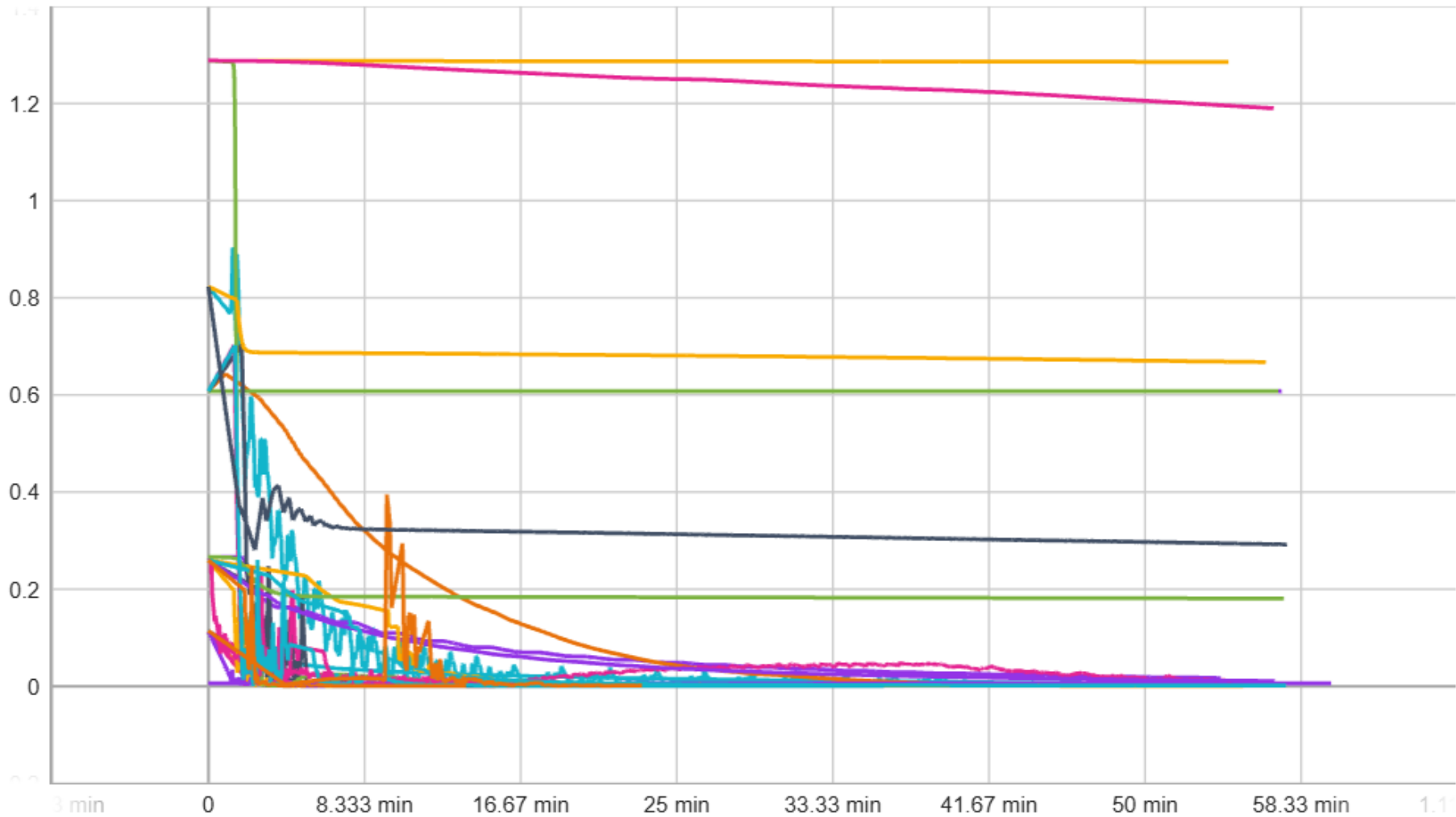
RMSE whole object: everything

RMSE_whole_object



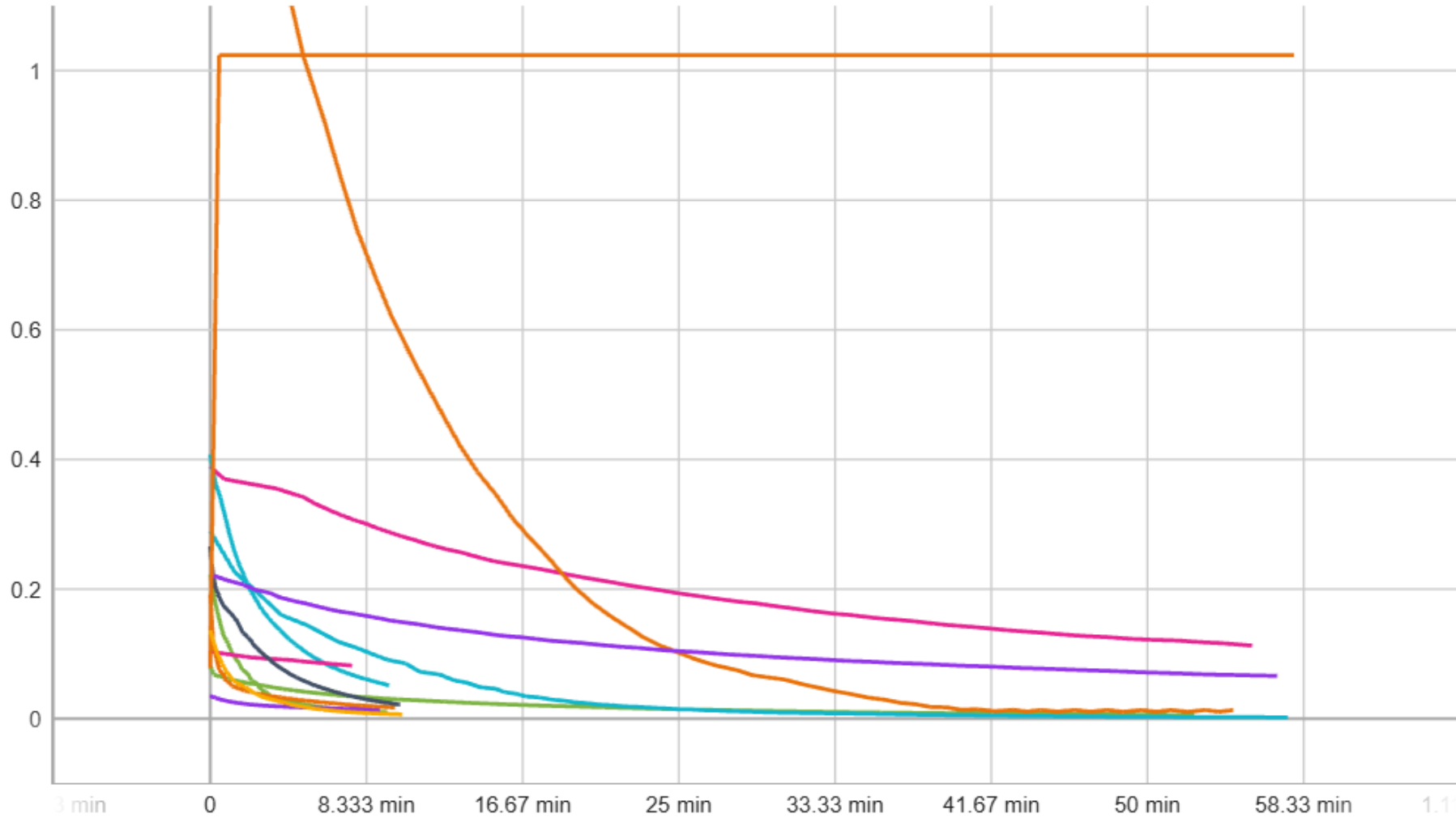
AEM all NEMA VOI 2

AEM_VOI_sphere2



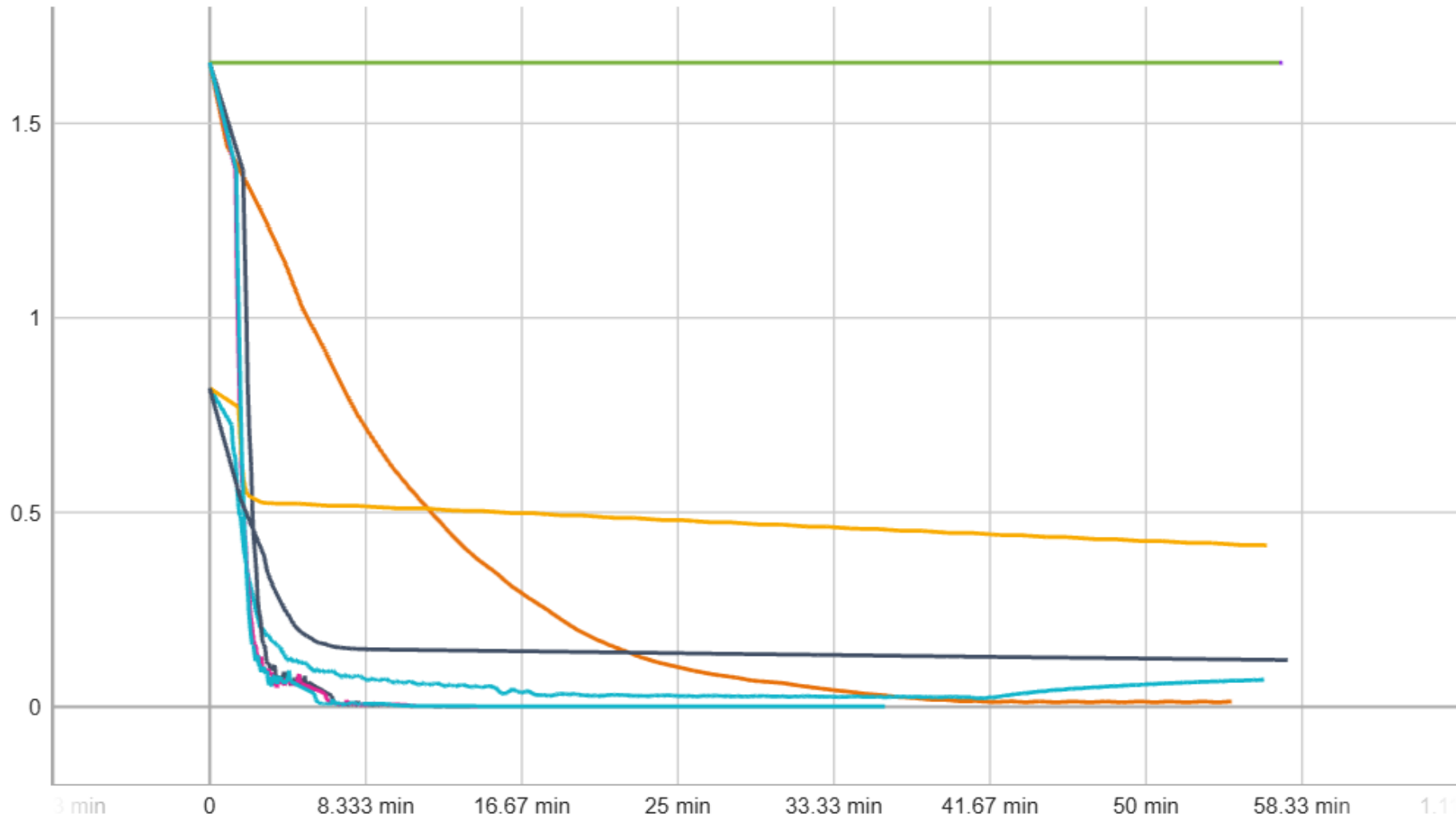
RMSE background: 1 algorithm

RMSE_background



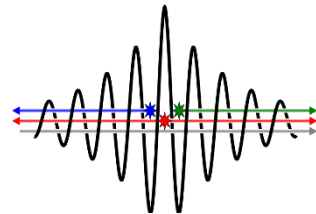
RMSE background: Vis 600 Zr NEMA

RMSE_background



Acknowledgements

- **Data**
 - GE Healthcare
 - National Physical Laboratory (UK)
 - Positrigo (CH)
 - Rijksuniversiteit Groningen (NL)
 - Siemens Healthineers
 - University College London (UK)
 - Turku PET Center (FI)
- **Funding**
 - CCP SyneRBI, i.e. UKRI
- **All participants**
- **Many contributors to OSS used for PETRIC**
 - SIRT, STIR, parallelproj
 - Python, scipy, matplotlib, docker, conda, Linux,...



Tied 2nd place: SOS (£300)

Sam Porter (UCL, UK)

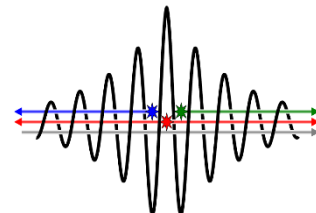
Margaret Duff (STFC, UK)

Edoardo Pasca (STFC, UK)



Approaches:

- Improved version of SVRG
(EM preconditioner with Armijo line search)
- **Improved version of SAGA**
(EM preconditioner with Armijo line search)



Tied 2nd place: EWS (£300)

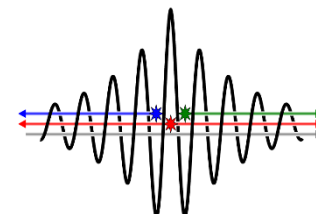
Imraj Singh (UCL, UK)

Alexander Denker (UCL, UK)

Approaches:

Various algorithms with better steps, precondition and neural network based warm-starts

- GD
- SGD
- **SAGA**



1st place: MaGeZ (£500)

Matthias Ehrhardt (Bath, UK)

Zeljko Kereta (UCL, UK)

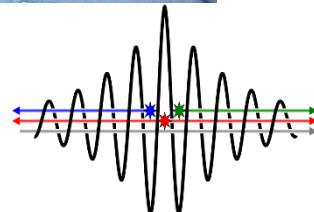
Georg Schramm (KU Leuven, Belgium)



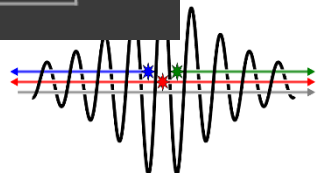
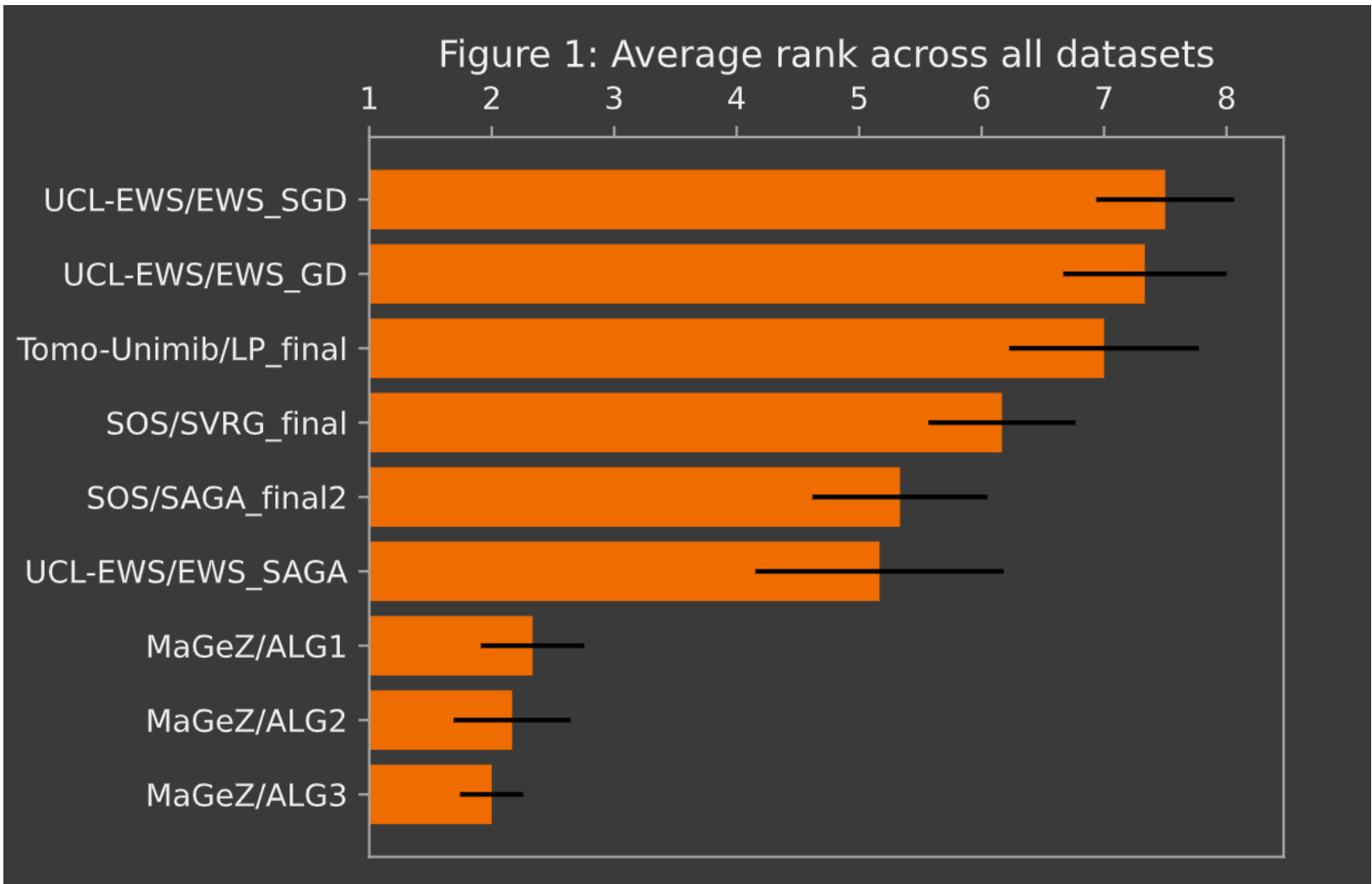
Approaches:

Improved versions of SVRG

- ALG1: Preconditioning
- ALG2: ALG1 + Stepsizes (Barzilai-Borwein)
- **ALG3: ALG2 + Subset selection**



All rankings



Links

- Information:

github.com/SyneRBI/PETRIC/wiki

- Data:

petric.tomography.stfc.ac.uk/data/

- Leaderboard:

petric.tomography.stfc.ac.uk/leaderboard

