EYRA

Benchmark Platform

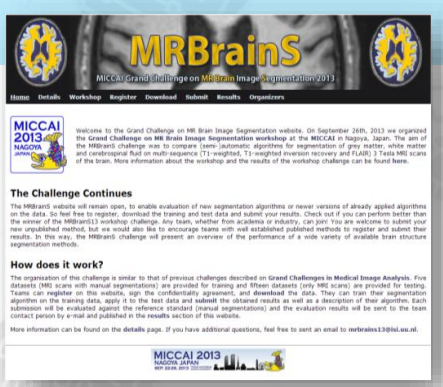
The Enlighten your Research (EYRA) Benchmark Platform

netherlands eScience center SURF

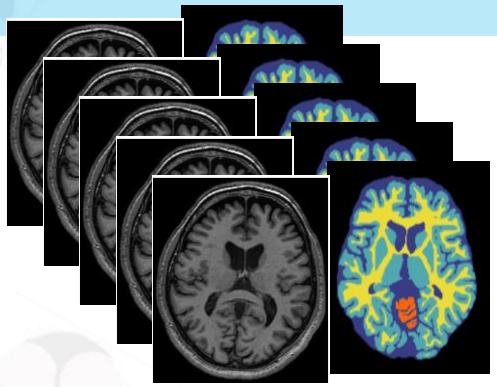
MRBrains challenge 2013

Teams

Register



Download
Training Datasets

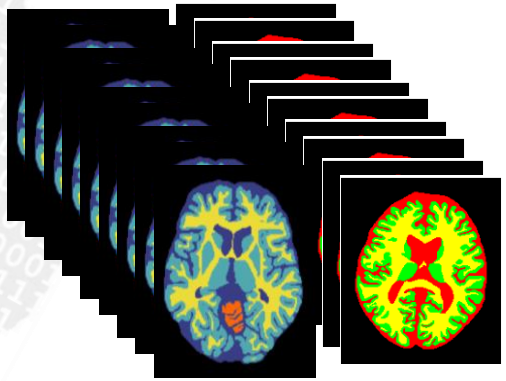


Download
Test Datasets

Train Algorithm
and Segment Test
Data

Submit
Results

Compared to
Ground Truth



Ranking algorithms
and show online

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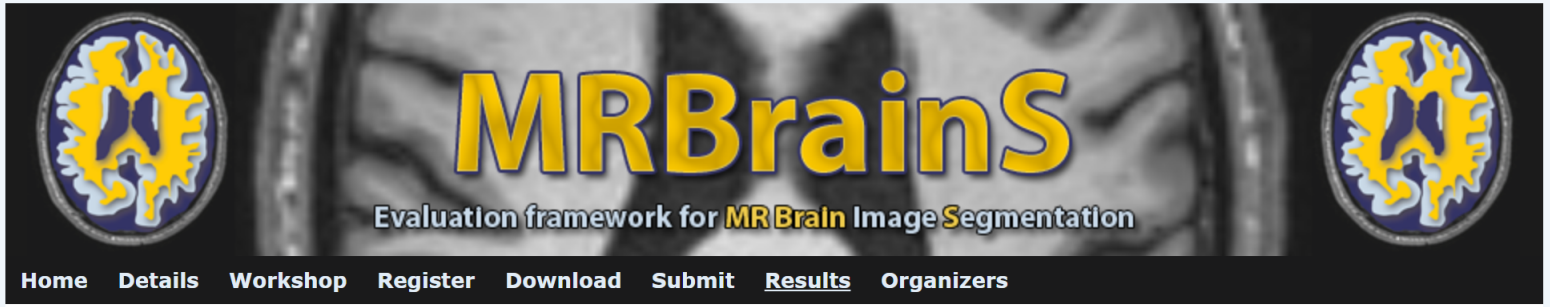
EYR Benchmark Platform

Leaderboard MRBrainS



Currently 60 Algorithms

Results

When teams **submit** their segmentation results, the evaluation results will be sent to the team contact person by e-mail and will be listed below.

Rank	Team name	Submission name	Date	Sum Scores	Sequences used	Speed	Doc
1	XMU_SmartDSP2	3D Spatial Weighted U-Net for Multi-modality Brain MRI Segmentation	29-08-18	32	T1; T1_IR; FLAIR	~10 min	
2	TailHot	Multi-modality aggregation network[3]	13-04-18	57	T1; T1_IR; FLAIR	~13 sec	
3	WTA2	3D Cascade convolutional architecture - Method 2[2]	23-05-18	68	T1; T1_IR; FLAIR	~2 min	
4	XMU SmartDSP	3D CNN with a Cross-modality Channel Attention Scheme[3]	17-08-18	76	T1; T1_IR; FLAIR	~10 min	
5	XLab	3D Fully CNN with Multi-Modality Feature Fusion[3]	10-08-18	85	T1; T1_IR; FLAIR	~2 min	
6	LIVIA_ETS	HyperDenseNet[2]	06-02-18	91	T1; T1_IR; FLAIR	~4 min	
7	CU_DL2	3D Deep Learning; voxnet2	28-06-16	102	T1; T1_IR; FLAIR	~2 min	
8	CU_DL	3D Deep Learning; voxnet1[3]	16-06-16	109	T1; T1_IR; FLAIR	~2 min	
9	LRDE	Fully Convolutional Network	20-12-16	116	T1	~2 sec	
10	MSL-SKKU	Deep Convolutional Neural Network	19-06-17	121	T1; T1-IR; FLAIR	~1.5 min	
11	MDGRU	Multi-Dimensional Gated Recurrent Units[3]	27-07-16	146	T1; T1_IR; FLAIR	~2 min	

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EYRA Benchmark Platform

- NeoBrainS Challenge on Brain Tissue Segmentation in MR Scans of Neonates: http://neobrains12.isi.uu.nl
- MRBrainS Challenge on Brain Tissue Segmentation in MR Scans of Adults: http://mrbrains13.isi.uu.nl

Organizers: Adriënne M. Mendrik, Ivana Išgum, Max. A. Viergever

Advisory board and panel discussion: Christian Barillot, Guido Gerig, Ali Gholipour, Koen van Leemput, Wiro Niessen, Sebastien Ourselin, Daniel Rueckert, Julia Schnabel, Martin Styner, and Simon Warfield

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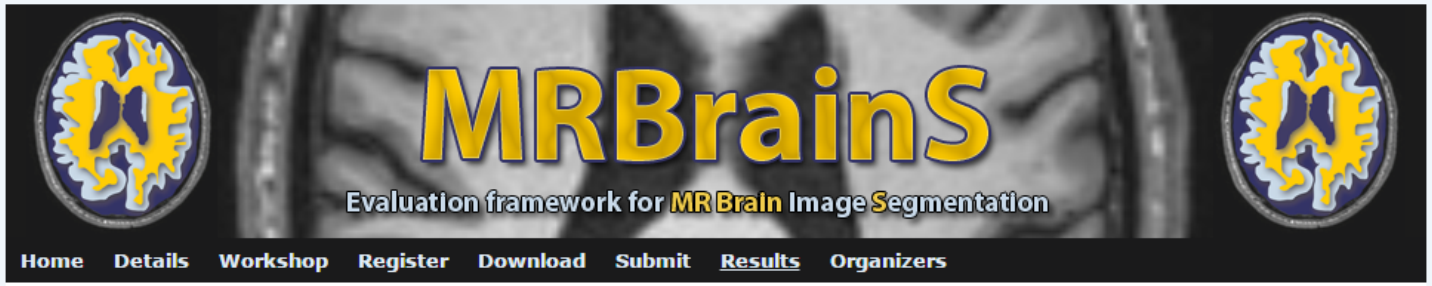
EYRA Benchmark Platform

Leaderboard MRBrainS 2015 (NEATBrainS workshop)



Home Details Workshop Register Download Submit Results Organizers

Results

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1	UNC-IDEA	LINKS:Learning-based multi-source integration	9/2/2015	26	T1; T1_IR; FLAIR	~3 min	
2	ISI-Neonatology	Multi-stage voxel classification	31-05-14	29	T1	~8 hours	
3	MNAB2	Random Forests	21-02-14	38	T1; T1_IR; FLAIR	~25 min	
4	KSOM GHMF	ASeTs: MAP-Based with Manifold learning	13-05-14	44	T1; T1_IR; FLAIR	~23 min	
5	BIGR2	Multi-Feature SVM Classification	26-09-13	57	T1; T1_IR; FLAIR	~35 min	
6	UofL BioImaging	MAP–Based Framework	26-09-13	63	T1	~6 sec	
7	CMIV	Model-guided Level Sets and Skeletons	26-09-13	76	T1; FLAIR	~3 min	
8	UB VPML Med	Multi-Atlas with Multiway Cut	26-09-13	83	T1; T1_IR; FLAIR	~30 min	
9	S2_QM2	Atlas-based segmentation and AdaBoost	28-07-14	87	T1; T1-IR; FLAIR	~45 min	
10	Narsil	Segmentation using Ensemble Trees	26-09-13	88	T1; FLAIR	< 2 min	
11	bigr_neuro	Automatically Trained kNN Classifier	26-09-13	89	T1; FLAIR	~2 hours	
12	Robarts	Multi-Atlas with Hierarchical Max-Flow	26-09-13	92	T1-1mm; T1-IR	~16 min	
13	MNAB	Random Decision Forests	26-09-13	106	T1; T1-IR; FLAIR	~15 min	
14	Jedi Mind Meld	Automated Walks using Machine Learning	26-09-13	127	T1; T1-IR; FLAIR	~27 sec	
15	LUH-TNT	Level-sets with dictionary learning	27-10-14	129	T1	< 1 min	
16	S2_QM	Bayesian-based Adaptive Mean-Shift	26-09-13	138	T1; T1-IR; FLAIR	~1.5 hours	
17	mlmi2014ss	AdaBoostM2	28-07-14	138	T1; T1-IR; FLAIR	~5 min	
18	ISTB UniBe	Decision Forests with spatial regularization	4/6/2014	149	T1; T1_IR; FLAIR	~3 min	

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EYRA Benchmark Platform

Wouldn’t it be great if we would have a platform that would present an overview of:

- the performance of algorithms on various challenges
- re-use data and ground truth from previous challenges in new challenges to answer new research questions

Kitware

Challenges@Kitware

The best software in the world is useless without the right data. Kitware's Data and Analytics team unites data and software from world-class researchers and developers through **data-driven** challenges.

Stephen Aylward
Senior Director of Strategic Initiatives

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EYRA Benchmark Platform

Enlighten Your Research (EYRA) Benchmark Platform

Overview
Algorithm Performance

Performance
Across Benchmarks

Domain Researchers

- Research Question
- Data
- Ground Truth
- Evaluation metrics

Benchmarks

Benchmark Platform

Algorithms

Algorithm Developers

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SURF

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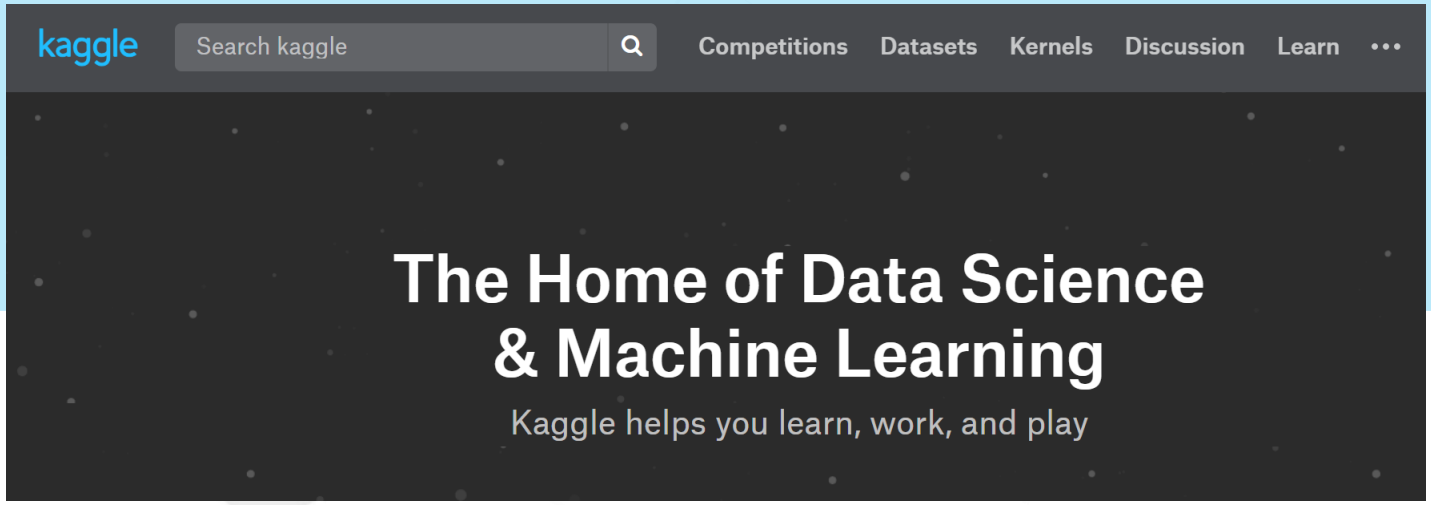


DREAM CHALLENGES

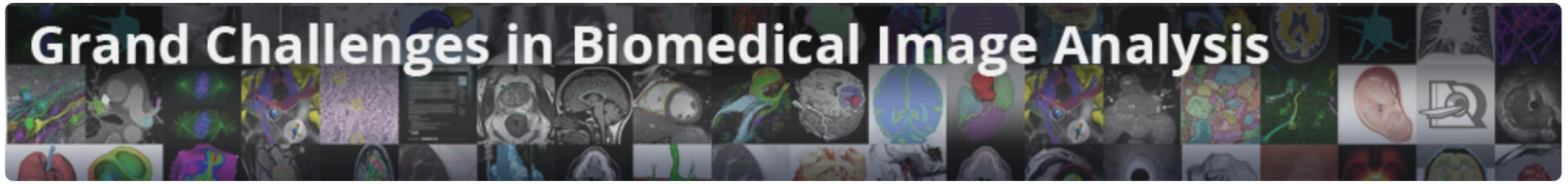
crowdAI

CodaLab

Accelerating reproducible computational research.

Challenges@Kitware

The best software in the world is useless without the right data. Kitware's Data and Analytics team unites data and software from world-class researchers and developers through **data-driven** challenges.



visceral

Sicas Medical Image Repository

sicas

Host a challenge

Sign in to create a new challenge

In 2012 a team with members from five groups in medical image analysis decided to build a platform to easily set up websites for challenges in biomedical images analysis. We named our group the Consortium for Open Medical Image Computing and COMIC is the name for our platform. COMIC is developed in python and django, is open source, and hosted on github where you can download it and start your own COMIC server.

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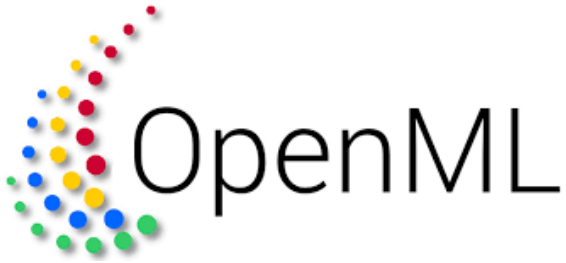
Platform

EYRA benchmark platform

- Easy to set up a research benchmark
- Cross-fertilization between scientific disciplines
- Overview of benchmarks per scientific discipline
- SURF infrastructure
- Insight into algorithm performance for a research problem, beyond the leaderboard.

Investigating collaboration with…

- Comic (grand-challenge.org)
  - Prof. dr. Bram van Ginneken (Radboud UMC, Nijmegen)
  - James Meakin (Lead Research Software Engineering team)
- OpenML
  - dr. Joaquin Vanschoren (TU Eindhoven)



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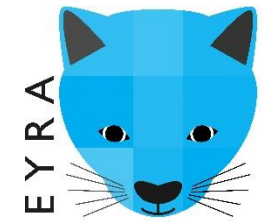
Cross-fertilization between scientific disciplines

Humanities & Social Sciences

Environment & Sustainability

Life Science & eHealth

Physics & beyond



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Use Case Social Sciences & Humanities

- Maria Eskevich (Central Office Coordinator CLARIN ERIC), digital collections of parliament data (open), speech recognition
- Melvin Wevers (Digital Humanities Lab, KNAW Humanities Cluster), in touch with KB (National Library) investigating several options for benchmarks using KB data

CLARIN
Common Language Resources and Technology Infrastructure

KB Koninklijke Bibliotheek
Nationale bibliotheek van Nederland

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EYRA Benchmark Platform

Cross-fertilization between scientific disciplines

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Life Science & eHealth

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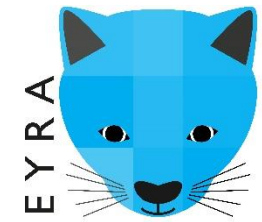

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Use Case Environment & Sustainability

- Dr. Mike Lees (UvA), dr. Monika Kuffer (University of Twente)
- Slum Detection on Satellite Images

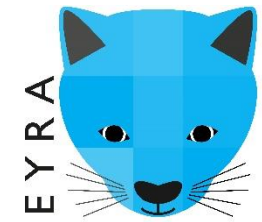
Cross-fertilization between scientific disciplines

Humanities & Social Sciences

Environment & Sustainability

Life Science & eHealth

Physics & beyond



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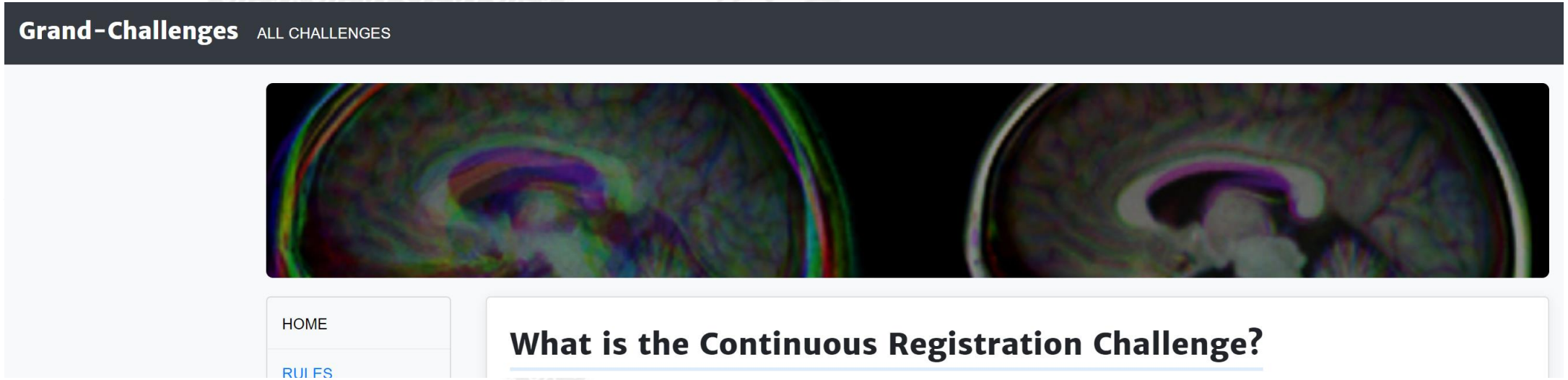
Use Case Life Sciences & eHealth

- dr. Marius Staring (LUMC), dr. Stefan Klein (Erasmus MC), Kasper Marstal (Erasmus MC)
- Medical Image Continuous Registration Challenge: https://continuousregistration.grand-challenge.org/



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Cross-fertilization between scientific disciplines

Humanities & Social Sciences

Environment & Sustainability

Life Science & eHealth

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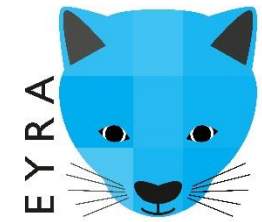

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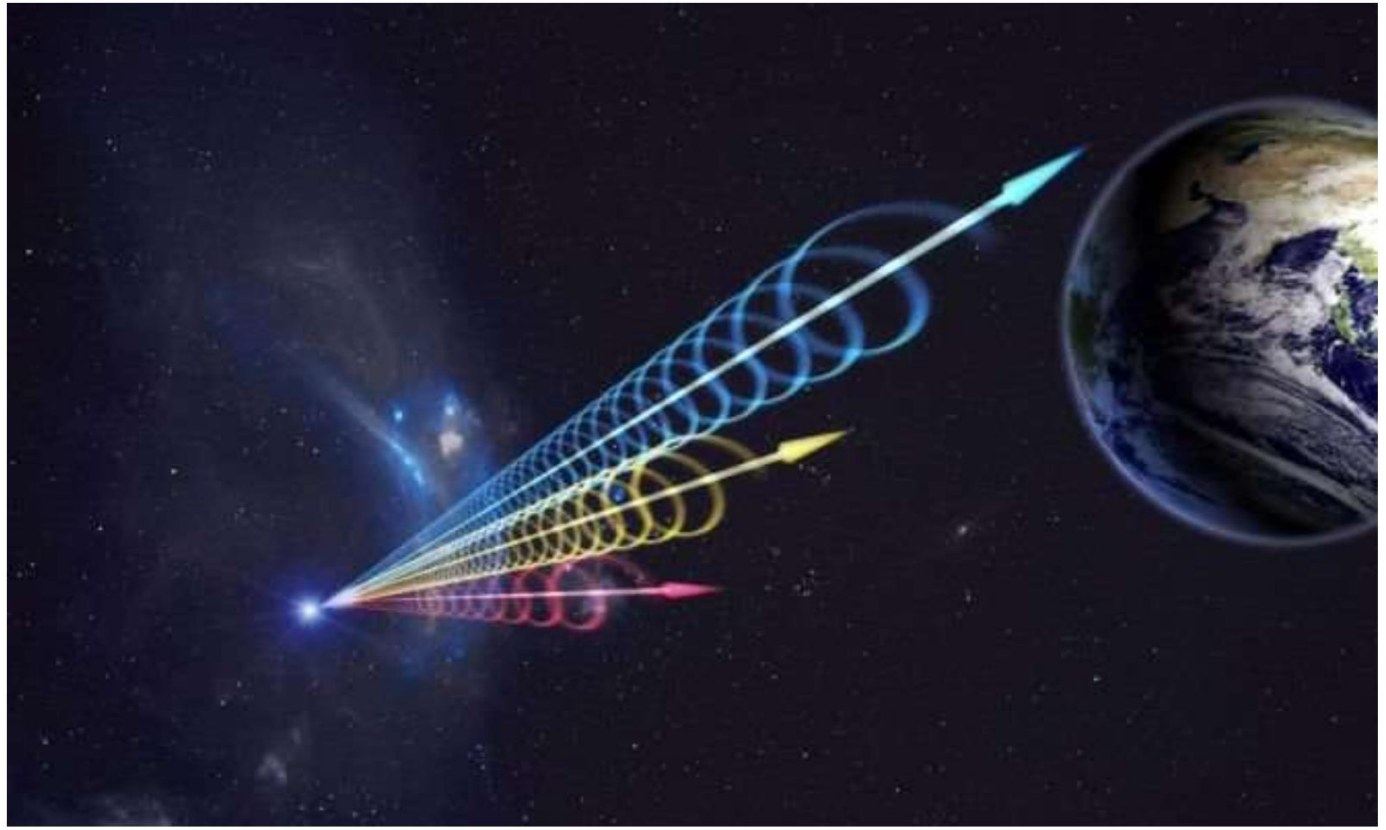
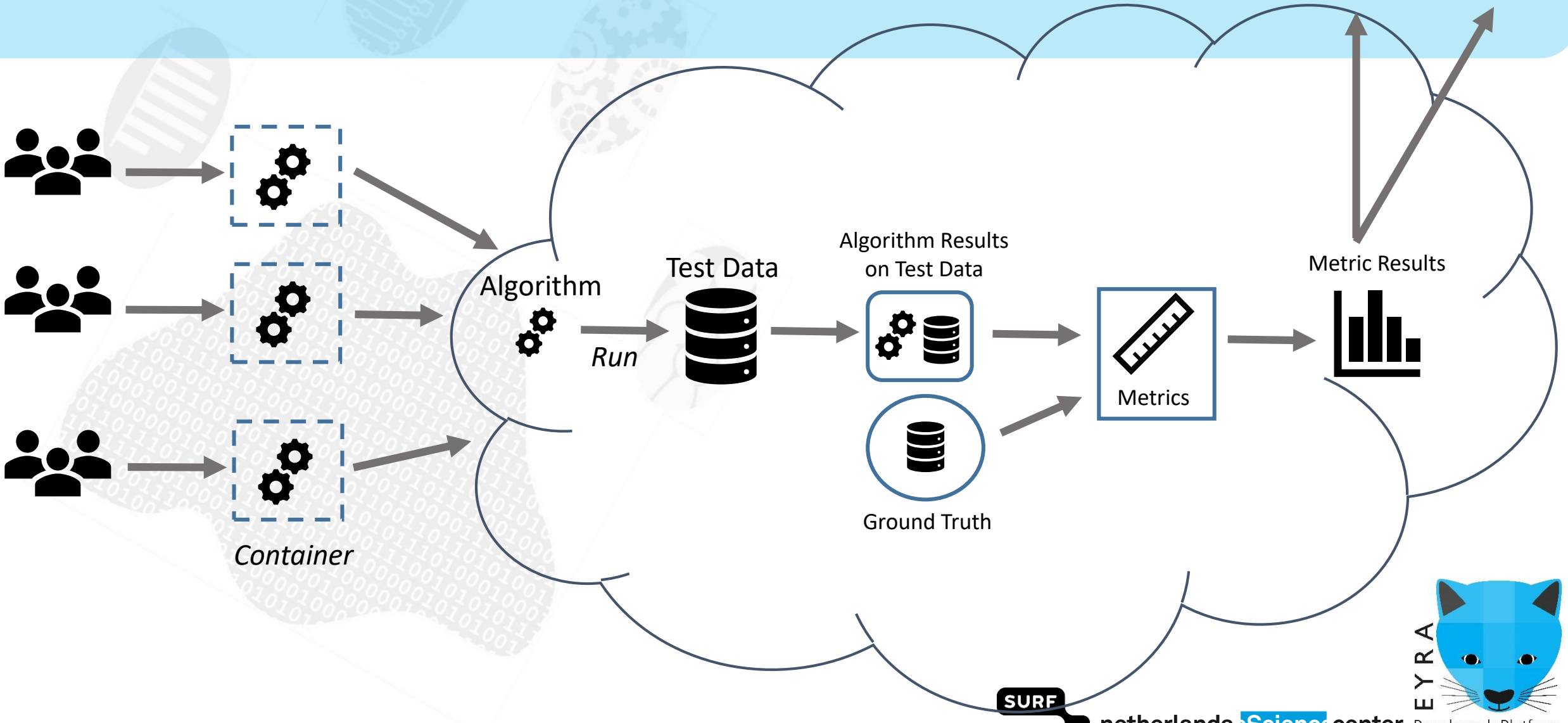
Use Case Physics & Beyond

- dr. Joeri v. Leeuwen (ASTRON), dr. Liam Connor (UvA) , dr. Alessio Sclocco (eScience center)
- Fast Radio Burst detection
- Several software packages, but never compared on the same data. Simulated data will be used.



Fast Radio Bursts are brief but powerful and as-yet-unexplained bursts of radio energy originating from deep space. Image via Jingchuan Yu/Beijing Planetarium, NRAO.

Evaluation Procedure



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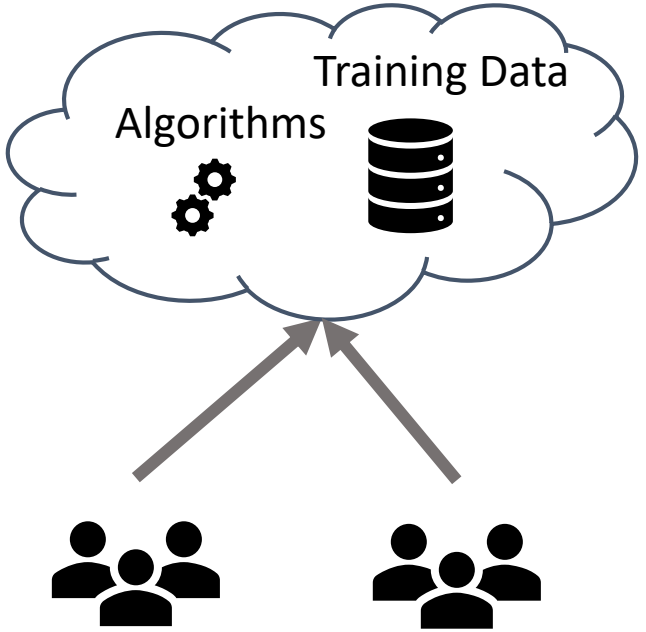
EYRA Benchmark Platform

Algorithm Development

SURF ResearchCloud



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EYRA Benchmark Platform

Mentimeter questions for discussion

- Have you ever used a benchmarking platform? And if so, which one?
- What features would you be interested in having in a benchmarking platform?
- Do you think other scientific disciplines could benefit from benchmarks in your field? And if so, how?
- To give an overview of benchmarks per scientific discipline, EYRA would like to provide a community space. Which features should this space have?
- Would you be interested in a collaborative environment for developing algorithms, like SURF ResearchCloud?
- What are must-have features for a collaborative environment like SURF ResearchCloud?