

Practical Software Sustainability at the Netherlands eScience Center

Dr. Jason Maassen

Technology Lead

J.Maassen@esciencecenter.nl

netherlands

eScience center

by SURF & NWO

Netherlands eScience Center



By Frits Ahlefeldt

**Bridging the gap between
science and e-infrastructure**



35
~~30~~

eScience Research Engineers

(also called Research Software Engineers)

**Broadly oriented
scientists**

at the interface of
research and ICT

**Close collaboration
with researchers**

to implement
eScience projects
and technology

**Developing usable &
sustainable tools**

suitable for a broad
range of users

Priority domains

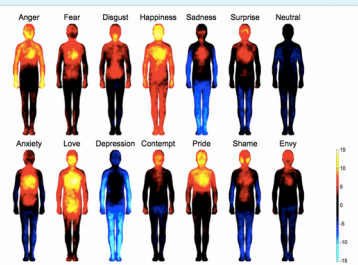
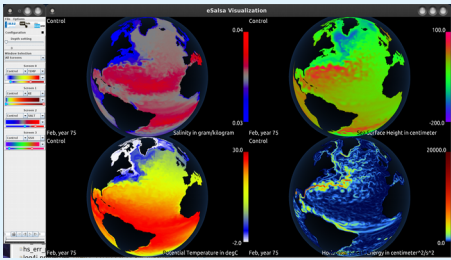


Fig. 2. Brain topography of basic (happy and sad) and complex (disgust and surprise) emotions associated with words. The color scale shows regions where activation increases (warmer colors) or decreases (cooler colors) when feeling each emotion. $P < 0.05$ FDR corrected. 1×1 mm. The colorbar indicates the statistical range.

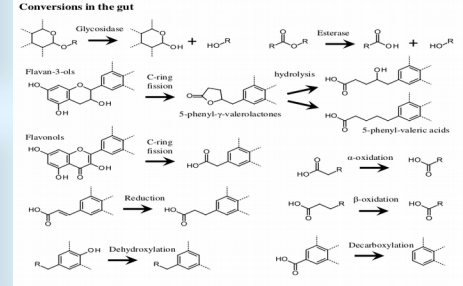
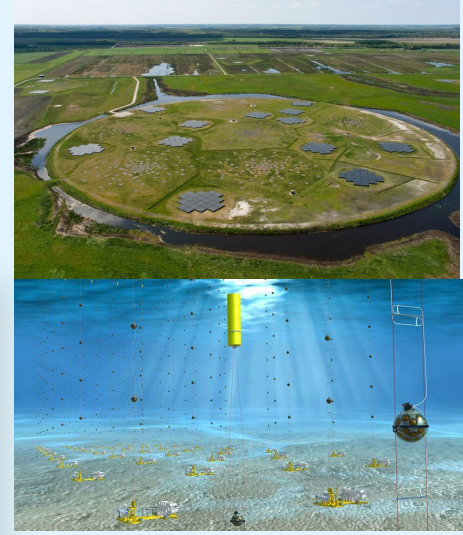
Humanities & Social Sciences

incl. SMART cities, text analysis, creative technologies



Physics & Beyond

incl. astrophysics, high energy physics, advanced materials

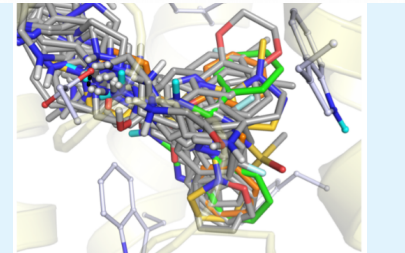


Sustainability & Environment

incl. climate, ecology, energy, logistics, water management

Life Sciences & eHealth

incl. bio-imaging, next generation sequencing, molecules



~80 projects
(on many different topics)

In our experience

Most researchers are NOT software engineers

They don't know about unit or integration testing, code coverage, code quality, etc.
Documentation always 'after the next paper is done'

Judged on #papers produced

... not on software and data releases nor on software quality!

Makes our job hard!

We need to convince researchers SWE is time well spent....



Our approach



Educate the researchers

Lead by example (shown them how they will save time in the long run)

Teach software and data carpentry courses

Generalize and reuse

Reusing tools often allow you to spread the SWE effort

Change the rules (you need to be a funding organization to do this)

Stick: make them set aside a certain percentage of funding for SWE

Carrot: give credits for quality software and data releases



Software Reuse

The screenshot shows the 'eScience Technology Platform' interface. At the top, there are navigation links for 'Software', 'Projects', 'People', and 'Organizations'. The main heading is 'Software'. Below this, there is a section for 'Click on the bars to find software projects.' and a '49 selected out of 49 records' indicator. A 'Disciplines' bar chart shows 'eScience Methodology' as the most prominent. A 'Competence areas' bar chart shows 'Big Data Analytics' as the most prominent. A 'Technical expertises' bar chart shows 'Scientific Visualization' as the most prominent. A 'Technologies used' bar chart shows 'Point clouds' as the most prominent. The main content area is a table with two columns: 'Name' and 'Description'. The table lists various software tools and their descriptions.

| Name | Description |
|---|--|
| AHN2 pointcloud viewer | WebGL point cloud visualization of AHN2 |
| AMUSE | The Astrophysical Multipurpose Simulation Environment |
| CClustera | A 3D web tool for interactive visualization of hierarchically clustered big data |
| Cesium-ncWMS | 3D Globe Visualization of NetCDF data. |
| Common Sense | User-friendly web application for showing (GIS) data on a map. |
| Cross-perspective Topic Modeling | A Gibbs sampler that implements Cross-Perspective Topic Modeling |
| DataVaults | Technology of Attachment to a DBMS of large file repositories. |
| Differential Evolution | Differential Evolution global optimization algorithm, with Metropolis for uncertainty estimation |
| eAstroViz | This tool can convert and visualize radio astronomy measurement sets, as well as most LOFAR intermediate data products. It also does RFI mitigation. |
| eEcology Annotation Tool | Visualize & annotate GPS measurements of bird movements |
| eEcology Tracker calendar | Calendar overview with daily statistics of GPS-tracker |
| eWaterLeaf | Web-based visualization for the eWaterCycle project |
| ExtJS-DateTime | DateTime form input field for ExtJS |
| FAIR Data Point | FAIR Data Point Metadata Service |
| GoogleEarth Toolbox for MATLAB | Export data from MATLAB to GoogleEarth's KML format. |
| Historic Embodied Emotions Model (HEEM) dataset | 279 17th and 18th century Dutch theater texts with HEEM labels |
| Kernel Tuner | A simple CUDA/OpenCL kernel tuner in Python. |

eScience Technology Platform

“An online platform that aims to stimulate collaboration and the reuse of software and knowledge.”

Stimulate software reuse in dutch Academia

Relevant software, workflows, demos, documentation, training, etc. in one place. Organize it in an intuitive way Measure the impact of the software

Prototype: <http://estep.esciencecenter.nl>



Get in touch

Netherlands eScience Center
Science Park 140
1098 XG Amsterdam
The Netherlands

+31 (0)20 4604770
info@eScienceCenter.nl



www.eScienceCenter.nl



linkd.in/1j2uS8S



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