Lumos

Unlocking STEREO's algorithms with QGIS plugins

Ann Crabbé, Ben Somers
What will I be talking about?

What is LUMOS?
   “Unlocking STEREO’s algorithms with QGIS plugins”
   + which algorithms are we talking about?

How did we get here?
   Round table & pre-study
   QGIS defence

Where will we go from here?
   Lumos workflow
Lumos?
Unlocking STEREO’s algorithms with QGIS plugins

• Valorisation of image processing algorithms
  • QGIS plugins
  • STEREO portal
  • Uniform tutorials & examples/exercises

• Users at different levels
  • Thematic users → user friendly GUI and standard settings
  • Expert users → advanced options
  • Developers → well documented code

OPEN SOURCE & REUSABILITY
## Image processing algorithms

### Hyperspectral tools

<table>
<thead>
<tr>
<th>Tool</th>
<th>Contributor</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyperforest – Local Max Filter</td>
<td>Friese Van Coillie, UGent</td>
<td>Define tree densities based on local maxima</td>
</tr>
<tr>
<td>Hyperforest – pktools</td>
<td>Pieter Kempeneers, JRC</td>
<td>General support for data processing</td>
</tr>
<tr>
<td>VIPER 2</td>
<td>Dar Roberts, UCSB and Ben Somers, KU Leuven</td>
<td>Advanced spectral mixture analysis (spectral libraries, endmember selection and MESMA)</td>
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### Time series tools

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<tr>
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<th>Content</th>
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<tbody>
<tr>
<td>HISEA - DINEOF</td>
<td>Aida Alvera, ULG</td>
<td>Fill missing data in time series (ocean RS)</td>
</tr>
<tr>
<td>FOMO</td>
<td>UCL/KU Leuven/HU Berlin</td>
<td>Pre-processing chain for dense time series analyses</td>
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### Synthetic Aperture Radar

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<tr>
<th>Tool</th>
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<th>Content</th>
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</thead>
<tbody>
<tr>
<td>InSAR</td>
<td>Dominique Derauw, ULG</td>
<td>Geo-projection of radar images</td>
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**Intellectual Property Rights**

- **Right of use** from LUMOS towards the algorithm owners
  - Owned by BELSPO? Publically accessible, so no threshold for non-commercial reuse
  - Owned by 3rd parties? Ask written consent
  - *We will only use software/data that is freely available*

- **Right of use** from 3rd party users towards the owners + liability
  - Login + agreement with the ‘Terms of Use’ before download is possible
  - **Terms of Use contain:**
    - The ownership and contact info
    - Users allowed + usage that is intended + usage that is allowed
    - Liability waiver
    - ...
How did we get there?
Round table: Jun ‘15
Discussion in June 2015
 Researchers, app developers, teachers, end users, project managers
 QGIS
 Uniform tools & uniform documentation (tutorials/examples/…)
 Sharing platform: BELSPO website

Further investigation: Nov ‘15 – Mar ‘16
 Keep it simple: steep learning curves are a deal breaker
 Scientist are no programmers, think about the user
 Other switchers: ORFEO, EnMap
 App-centered development (like QGIS plugin) and not software-centered (like stand alone toolbox)
How users see developers

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How developers see users

UG UG!!
QGIS

- Free and Open Source
- Mature software
- Support of a wide user/developer community
- Integrated (OSGeo) with GDAL/OGR library, PostGIS database, GRASS, …

Python

- The base language for QGIS plugin writing
- Modern language
- Platform independent
- Some benefits for developers: interpreted, high level, garbage collection, integration/interfaces
Where to go from here?
Lumos workflow

Task 1: Study content and code
Task 2: Python and PyQGIS development
  o Core task
  o Translated to/re-written in or plugged into Python
  o Each tool should serve users at 3 levels
    • Thematic user: User friendly GUI – standard settings
    • Expert user: User friendly GUI – expert options
    • Developer: Well documented code to tweak

Task 3: Documenting code
Task 4: User manual (thematic and expert users)
Task 5: Test data & exercises
Task 6: Debugging

+ Protocol for future STEREO algorithms?
Questions?

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