Open Source Tool Blending: Image Analysis in KNIME

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Image Processing and Analysis
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**Instagram**: 95M photos a day (~60PB/year)
**Facebook**: 300M photos a day (~180PB/year)
**Surveillance Cameras**: 1000PB / year
**Bio-Imaging**: TB/2s
Image Analysis

Tool Blending and Integration

Storage ➔ Image Processing ➔ Data Analysis ➔ Visualization

Run somewhere on many images
Accessible for non-experts
KNIME Image Processing – ImageJ2 Integrations
KNIME Image Processing

• Set of KNIME extensions to process and analyze images
• Approx. 100 nodes for IO, Preprocessing, Manipulation, Segmentation, Tracking, Feature Extraction, Visualization, ...
• Based on ImgLib2, SciJava, SCIFIO, BioFormats, ...
ImageJ2 Integration

ImageJ2 in KNIME

- “Write once, run anywhere”
- Automatic node generation from ImageJ2 plugins
- Add own ImageJ2 Plugins via installer
- Shared algorithm repository (ImageJ-Ops)
- From scripts to nodes*
Clear Volume
BigDataViewer*
ImageJ2 Plugin Scripting*

*Work in Progress
KNIME Image Processing – More Integrations
Ilastik
DeepLearning4J

DL4J Model
Initializer Convolution Layer Pooling Layer Convolution Layer Pooling Layer Dense Layer

LeNet AlexNet
And More ...

- OME RO
- Tess4J
- Python Extensions
- TrackMate
- ImageJ1-Macro
- ...

...
Use-Cases
Celebrity Recognition

Cameron Diaz
Cell Classification & Tracking
Smart Microscopy
And more ...

**BiolImaging**
- Image Classification in Histopathology
- Learning of Segmentation
- Object Classification
- Simple Task Workflows (Counting, Measurements, ...)
- Multi-View Reconstruction (SPIM)*
- ...

**Classical Image Analysis**
- Large Scale Object Recognition
- Face Recognition
- Car Counting
- Pedestrian Tracking*
- ...

... Check our example workflows!

*Work in Progress
Why KNIME & ImageJ?

• Joined Efforts of two Leading Communities
• Big Image Processing and Analysis
• Exploration and Prototyping
• Scaling and Automation
• Bridging Domains
Get Involved!

- Update Site
- Installation Details, News, Wiki, GitHub
- Forum
- Contact Information
- Example Workflows/Tutorials/Videos...

http://knime.imagej.net
http://imagej.net
Questions?