AutoTx
(and more...)

Smart automatic background data transfer for Windows

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AutoTx

Smart automatic background data transfer for Windows

Windows

- Service based on .NET 4.5
- Targets an ActiveDirectory environment

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Data Transfer

- Source: ***local*** disk drive

- Target: ***UNC path***
  (SMB network share)

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Background

- System service
- Autonomous
- Resource Monitoring

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Automatic

- Queueing
- Suspend & resume
- Email notifications

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AutoTx

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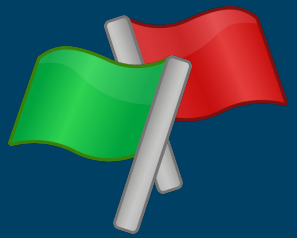
Smart

- Constant monitoring
- Suspending transfers



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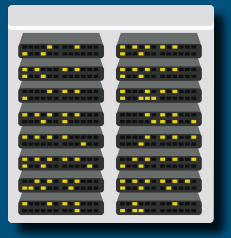
AutoTx - General setting and motivation



central storage

Active Directory

many microscopes

precious time

Goal: take away the transfer task from the user & make it easy!

AutoTx - under the hood

- Service core
  - *C# / .Net 4.5*
- Transfer Task
  - *RoboCopy*
- Wrapper library for C#
  - *RoboSharp* (MIT license)

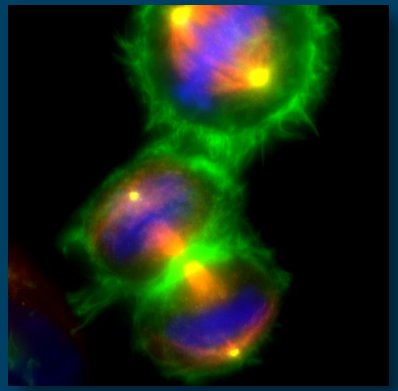
Ready for transfer…?

The microscope aspect

- How to tell the acquisition is done with a given file?
- With 100% accuracy…!?

Don’t mess with the photons!

The microscope aspect



Acquisition has top priority

AutoTx -
User’s Perspective

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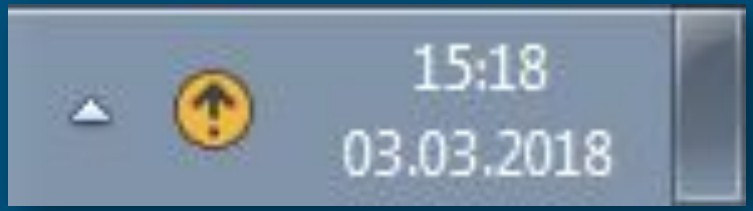
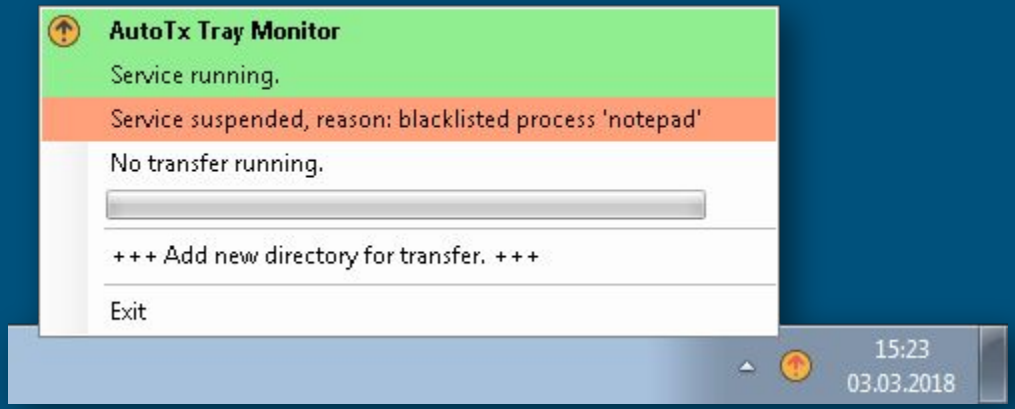
Usage

User’s entry point is the corresponding Tray App



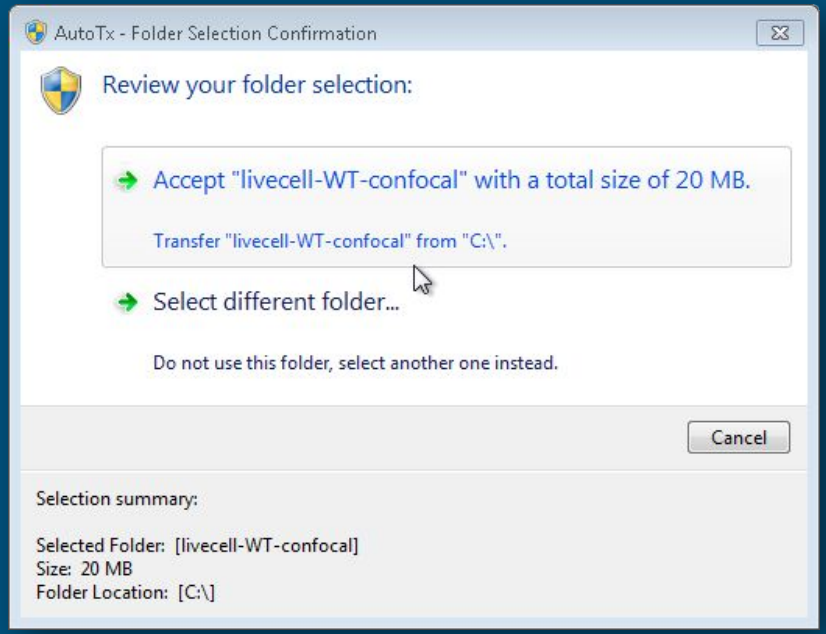
Usage - Tray App

- Current state
- What’s going on



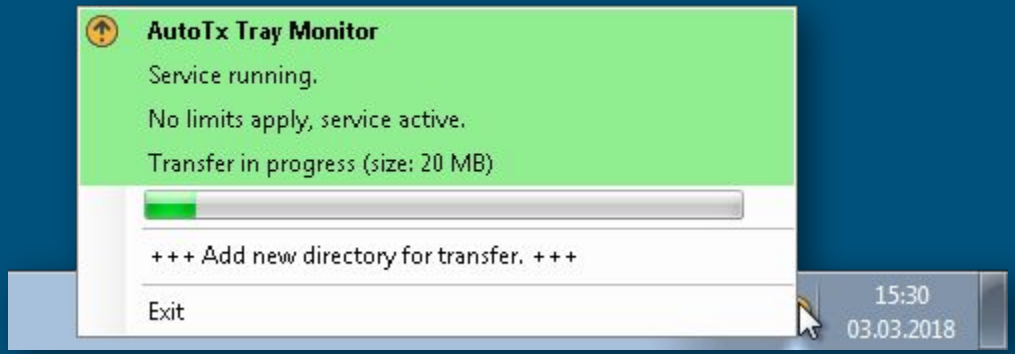
Usage - Tray App

- Current state
- What’s going on
- Initiate new transfers



Usage - Tray App

- Current state
- What’s going on
- Initiate new transfers
- Real-time progress



AutoTx

Notifications
Configuration
Cleanup
Updates

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AutoTx

Notifications
Configuration
Cleanup
Updates

Notifications

- Users
- Admins

AutoTx

Notifications
Configuration
Cleanup
Updates

Configuration

- Simple XML
- Minimal parameter set
- Two “layers”

common config

```
<ServiceConfig>
    <!-- IncomingDirectory: directory on SourceDrive to watch for new files -->
    <IncomingDirectory>ProgramData\AUTOTRANSFER\INCOMING</IncomingDirectory>
    <!-- ManagedDirectory: dir on SourceDrive where folders are queued for
         transfer ("PROCESSING") and stored after the transfer ("DONE"). -->
    <ManagedDirectory>ProgramData\AUTOTRANSFER</ManagedDirectory>
    <!-- DestinationAlias: friendly name for the target to be used in mails -->
    <DestinationAlias>Core Facility Storage</DestinationAlias>
    <!-- DestinationDirectory: where files should be transferred to -->
    <DestinationDirectory>\\fileserver.mydomain.xy\share\</DestinationDirectory>
    <!-- TmpTransferDir: temporary directory relative to DestinationDirectory
         to be used for running transfers -->
    <TmpTransferDir>AUTOTRANSFER-TMP</TmpTransferDir>
    <!-- MaxCpuUsage: pause transfer if CPU usage is above this value (in %)-->
    <MaxCpuUsage>25</MaxCpuUsage>
    <!-- MinAvailableMemory: pause transfer if free RAM is below (in MB) -->
    <MinAvailableMemory>512</MinAvailableMemory>
</ServiceConfig>
```

AutoTx

Notifications
Configuration
Cleanup
Updates

Cleanup

- Data moved to “grace” location
- No deletion!
- Notifications when expired

AutoTx

Notifications
Configuration
Cleanup
Updates

Updates

- Plenty of systems
- Several components
  - Service executables
  - Configurations
  - Message templates
  - Log files

→ Service Updater 

AutoTx Next

- Entire code base is GPLv3
  - github.com/imcf/auto-tx
- Planned features
  - Multiple target locations
  - Network credentials
  - OMERO imports

What else?

The “more” part...

Bio-Formats via Python

- Bio-Formats
- scikit-image
- matplotlib

→ 3D stacks

size-related metadata

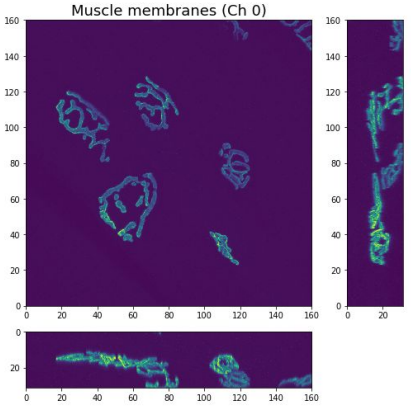
```
In [20]: 1 md_sizes
```

Out[20]:

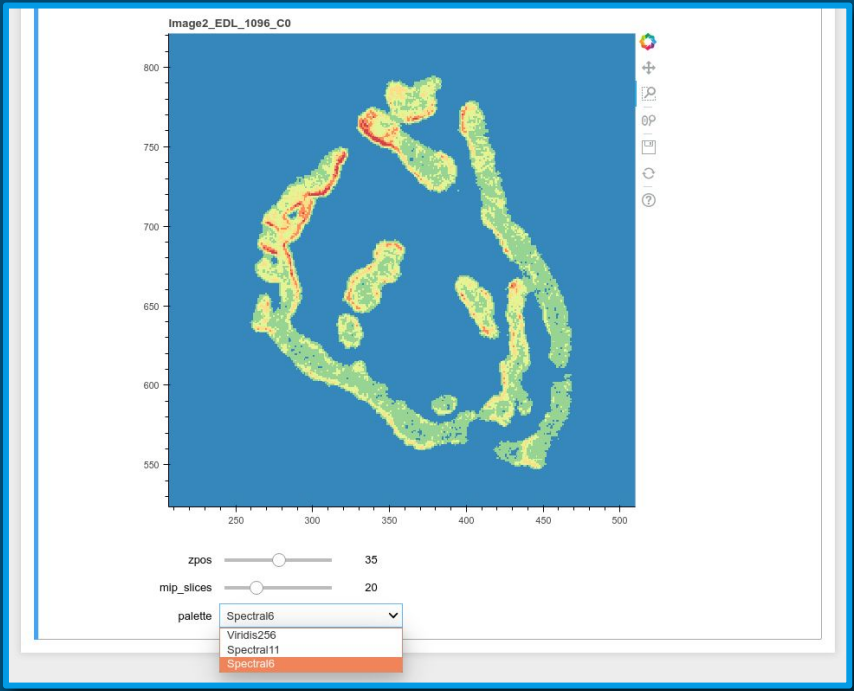
	x	y	z
count	1024	1024	70
size	0.156292	0.156292	0.445464
extent	160.043	160.043	31.1825
unit	µm	µm	µm

image stacks ortho-views

```
In [22]: 1 display_stack(ch_membranes, "Muscle membranes (Ch %d)" % ch_nr_membranes, 7)
```



Stacks with bokeh




```python
def update(zpos, mip_slices, palette):
    """Update the figure with new settings.

    zpos : int
        The new z-position in the stack.
    mip_slices : int
        The amount of slices to use for the maximum intensity projection.
    palette : str
        The palette to use for displaying the image.
    """
    i.glyph.color_mapper.update(palette=palette)
    dz = int(mip_slices / 2)  # delta-z
    if dz == 0:
        i.data_source.data['image'] = [ch0[zpos, ...]]
    else:
        zlower = zpos - dz if zpos > dz else 0
        zupper = zpos + dz if zpos + dz <= dimz else dimz
        i.data_source.data['image'] = [ch0[zlower:zupper, ...].max(axis=0)]
    push_notebook()



p = figure(title=fname, x_range=(0, dimx), y_range=(0, dimy))
i = p.image(image=[ch0[int(dimz/2), ...]],
            x=0, y=0, dw=dimx, dh=dimy,
            palette='Viridis256')

show(p, notebook_handle=True)

interact(update,
         palette=['Viridis256', 'Spectral11', 'Spectral6'],
         zpos=IntSlider(value=int(dimz/2), max=dimz-1, continuous_update=False),
         mip_slices=IntSlider(value=0, max=dimz-1, continuous_update=False))
```

OMERO-CellProfiler



→ See our Poster!

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Plate-Data Quality Control

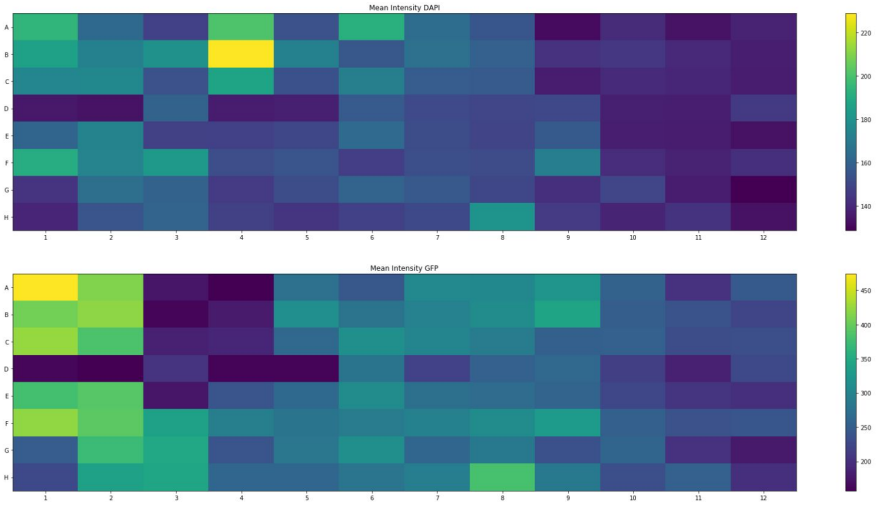
- Overview on plate wells
- Quick & Easy
  - Sharpness
  - Average Intensity

```
w = widgets.Dropdown(options=list(range(1,field+1)))
w2 = widgets.Dropdown(options=['Sharpness','Mean Intensity'])

# Make the plots interactive
interactive(plotit,fieldNbr=w,choice=w2)
```

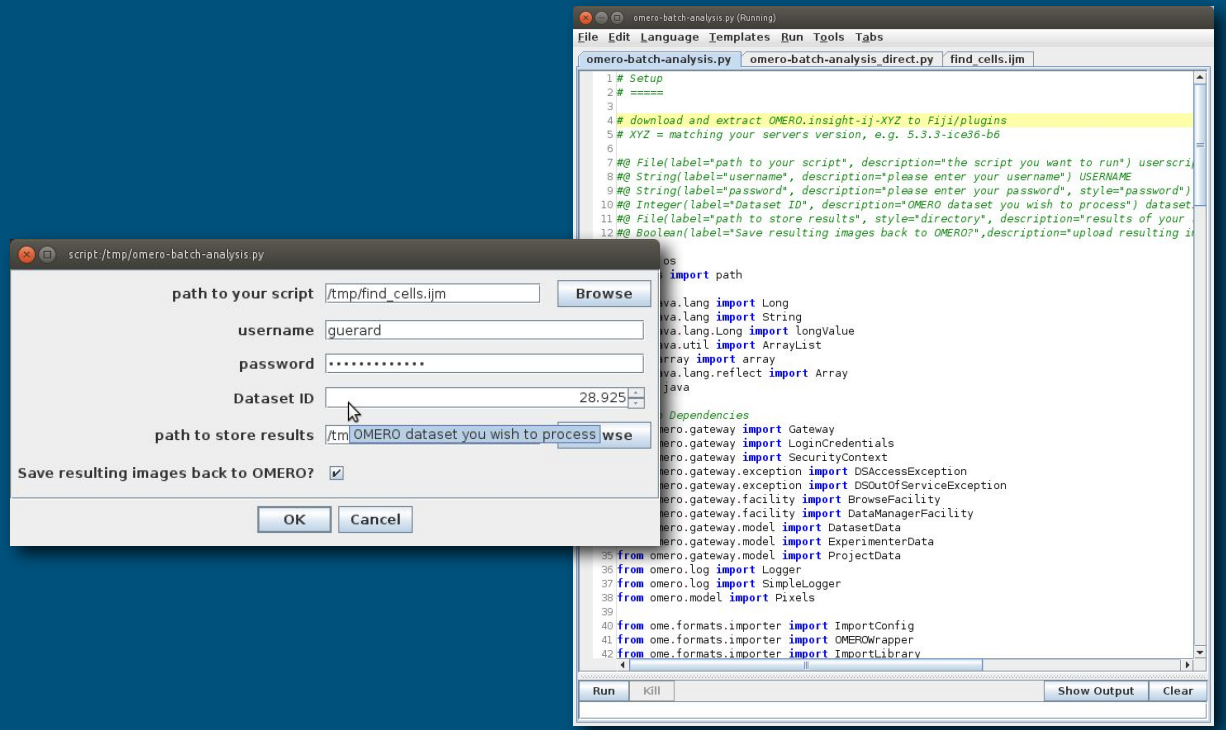
fieldNbr 1

choice Mean Intensity



ImageJ ⇆ OMERO

- Client side
- Sparse data
- ROIs
- Batching



Who we are...

Oliver Biehlmaier

Kai Schleicher

Laurent Guerard

Niko Ehrenfeuchter

Who we are - and where?