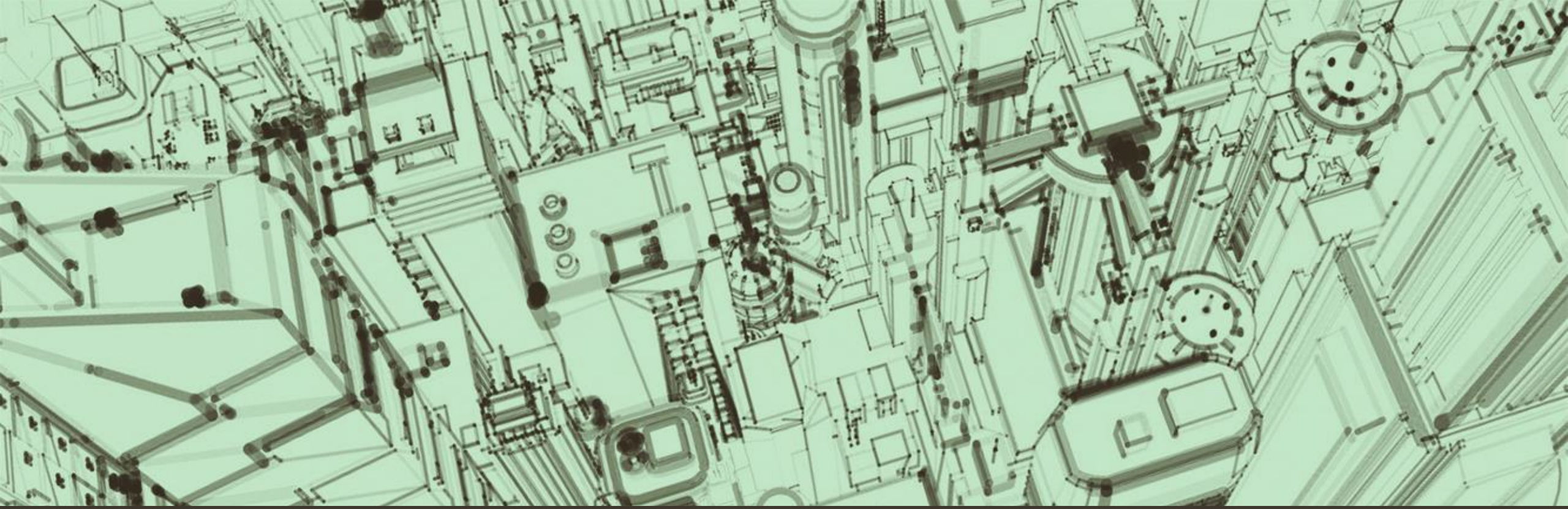


Automated Stereoscopic Image Conversion and Reconstruction

Judit Z. Tövissy

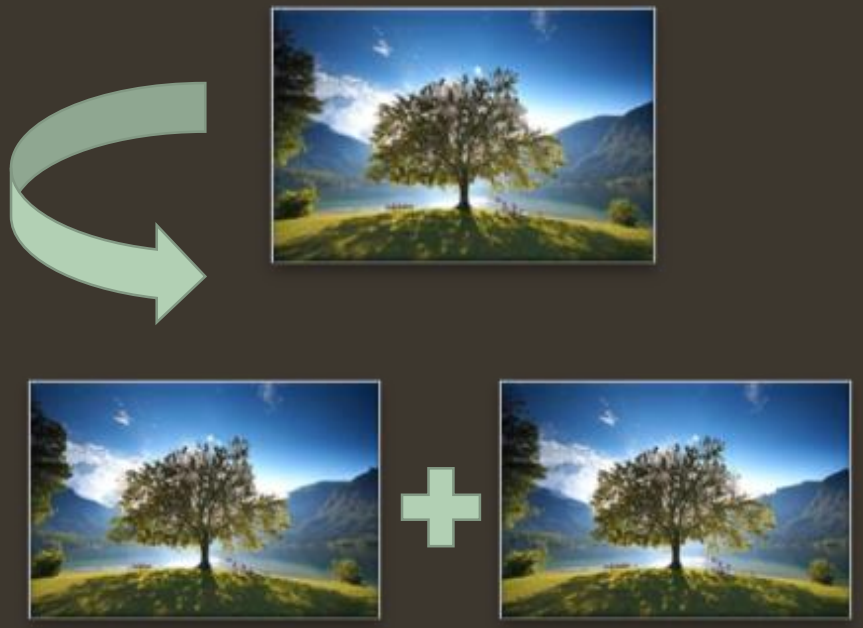
Dennis Gabor College / Ericsson Hungary

MMO Conference, 01.06.2018.

3D Reconstruction

Multiple View Angles → 3D Model

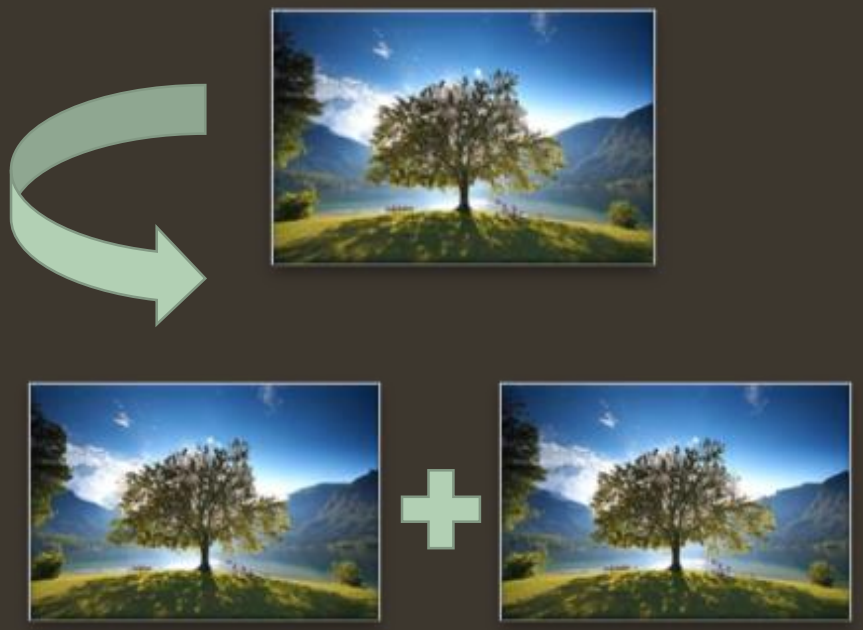
Single View → Stereoscopic 3D Image Pair

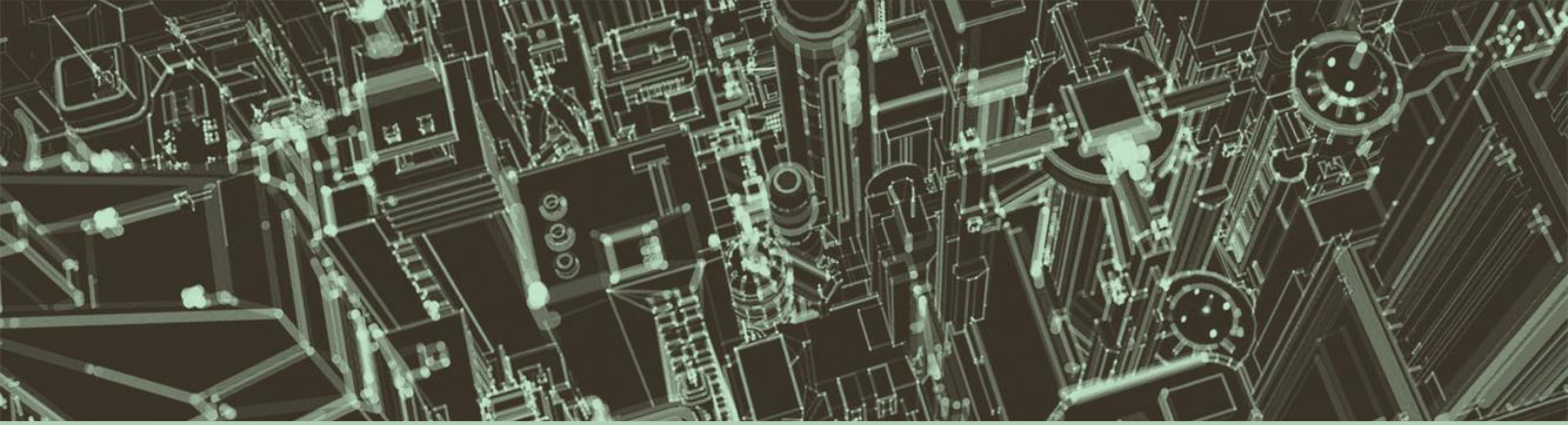


3D Reconstruction → 3Dify

Multiple View Angles → 3D Model

Single View → Stereoscopic 3D Image Pair

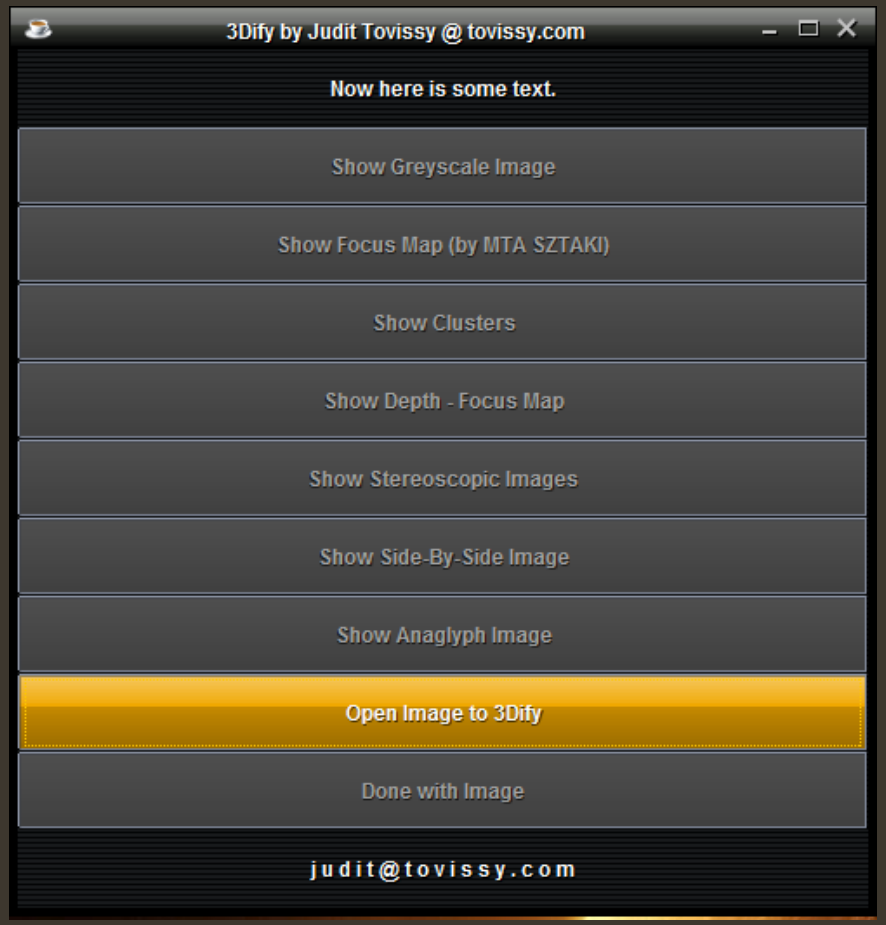




3Dify

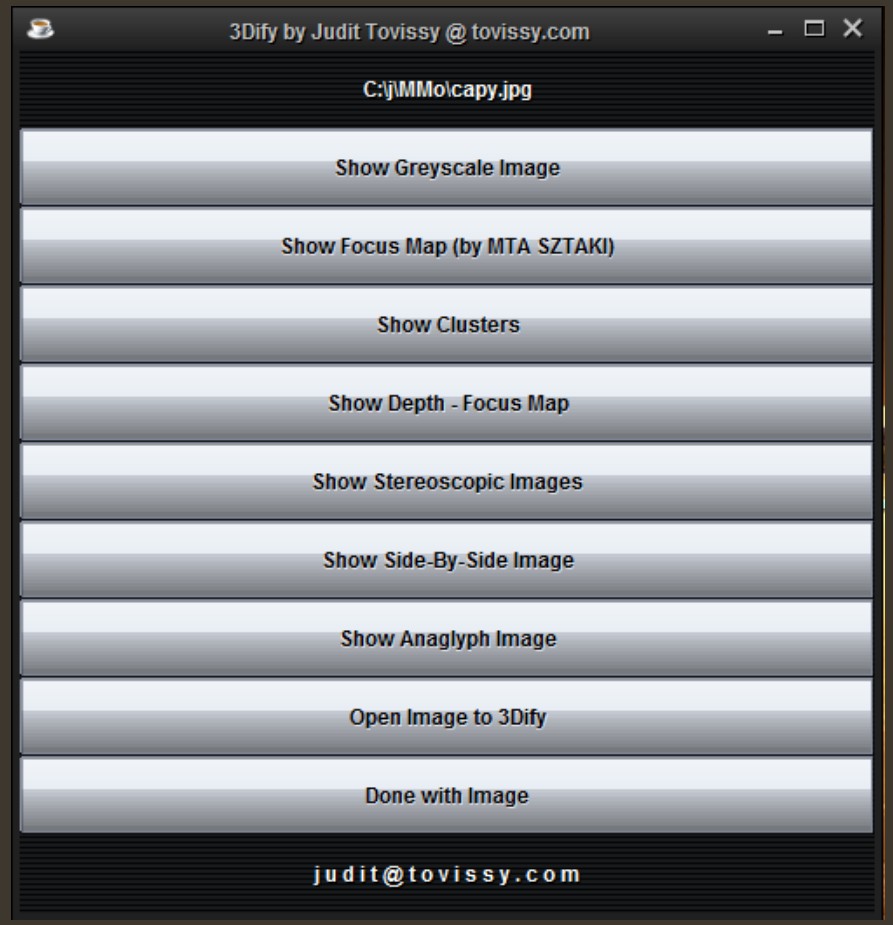
Software Prototype Tool

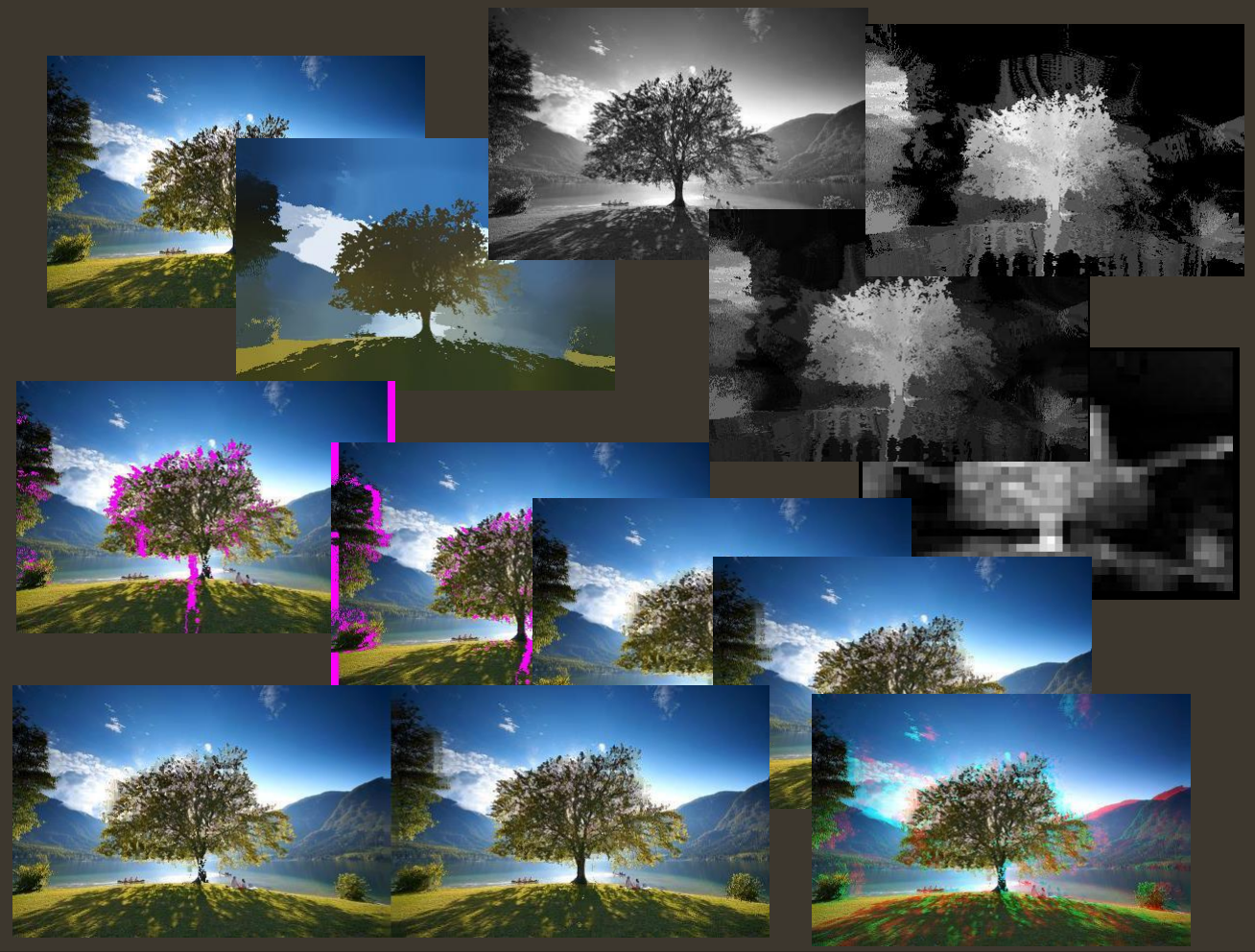
3Dify GUI



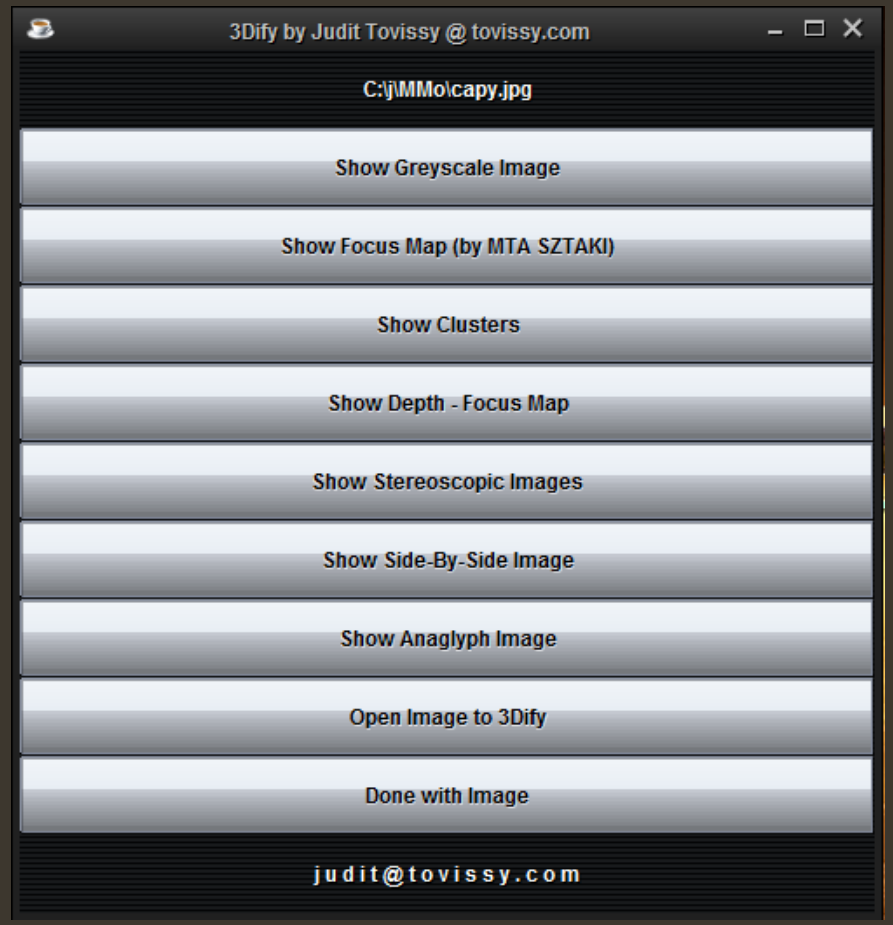
- Easy but powerful interface
- Demonstrate the process

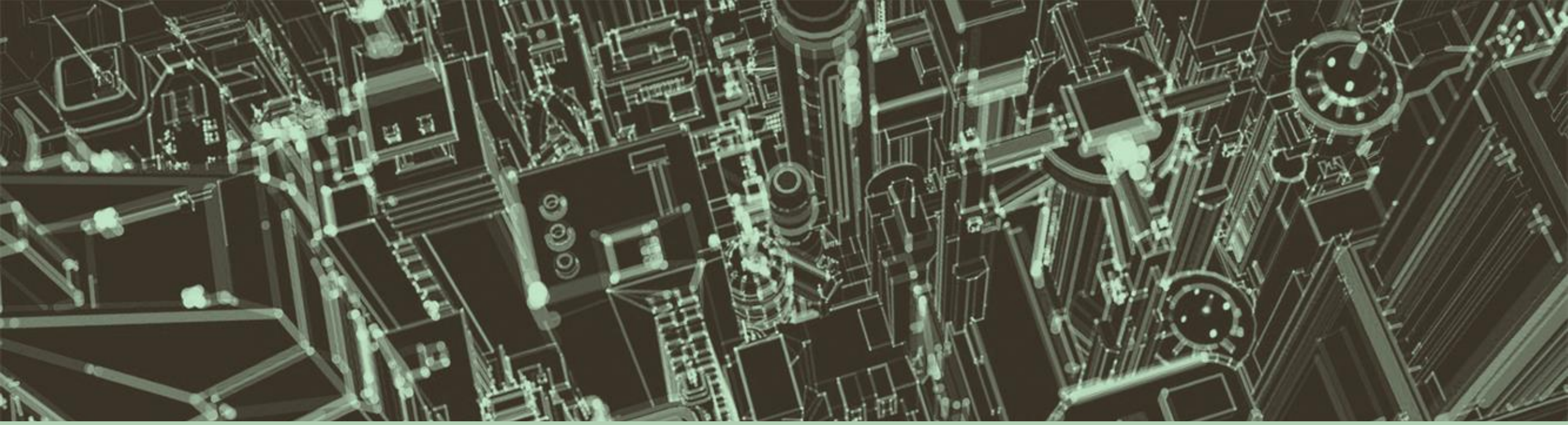
3Dify Process





3Dify Results





Conversion Process

How does 3Dify work?

Distance Representation

Color Map

Distance / Depth / Z Map

Premises

I. Focus

- Objects **in focus** are likely to be closer to the camera than others

II. Brightness

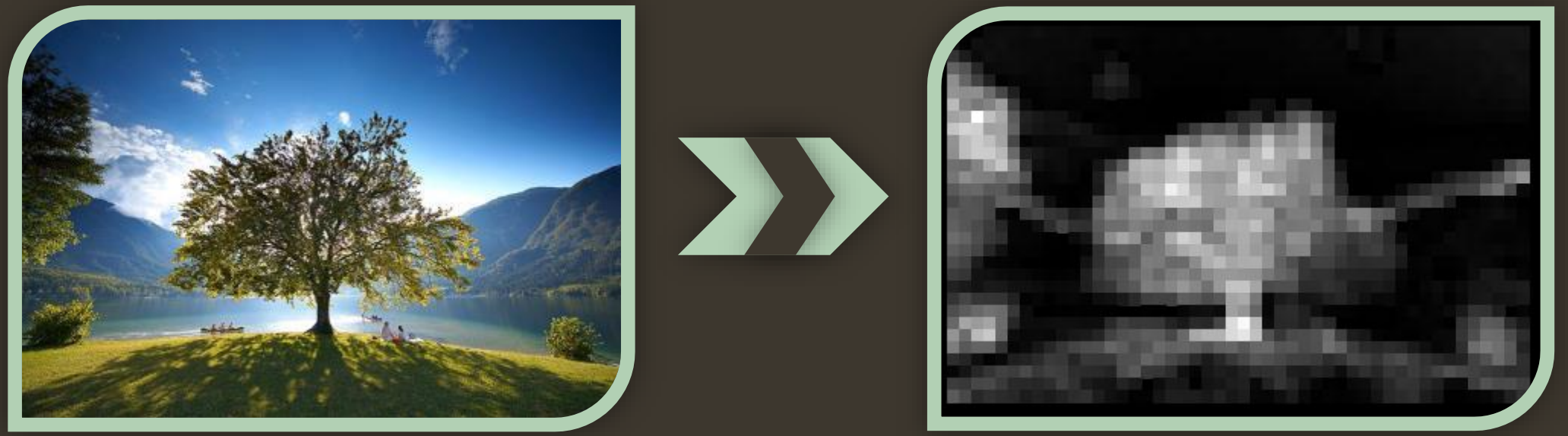
- Objects that are **brighter** are likely to be in the foreground of an image

Steps of the Conversion Process

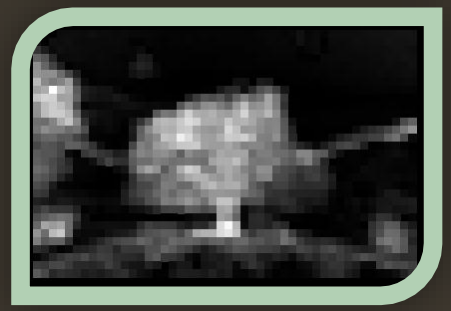
1. Clustering

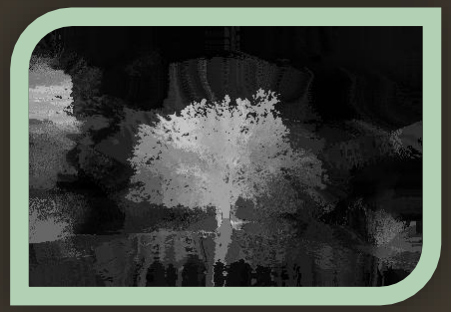
2. Brightness Map

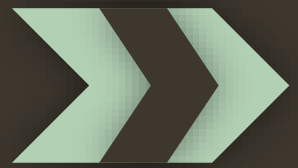
3. Focus Map (by MTA SZTAKI)

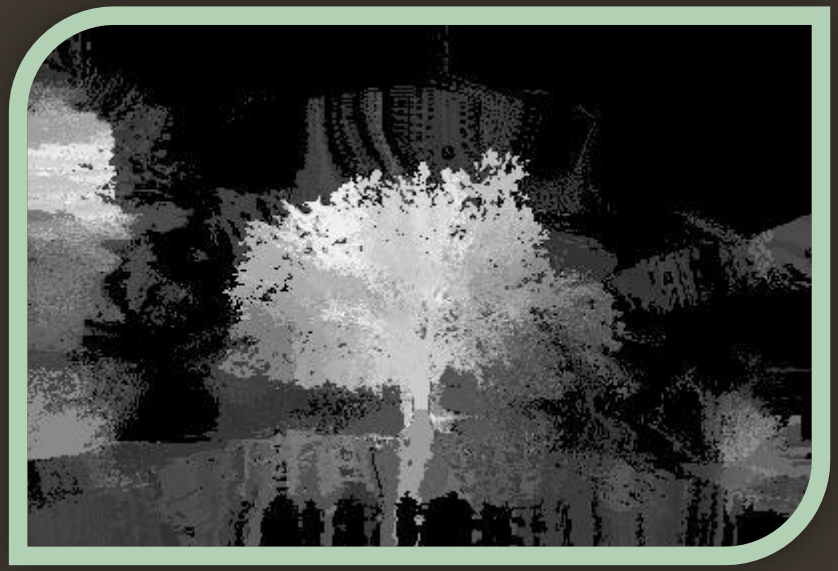


4. Depth-Focus Map = Final Z-Map

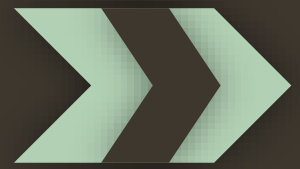








5. Original + Z-Map = Converted Pair

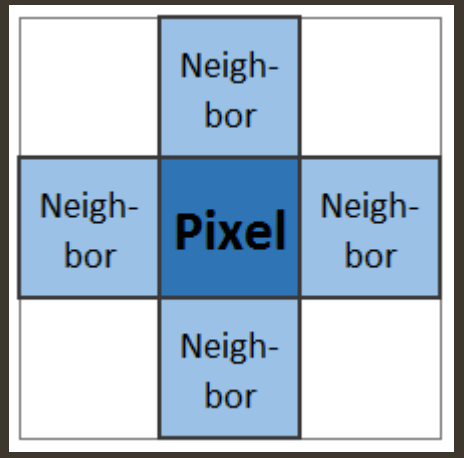


Steps of the Reconstruction Phase

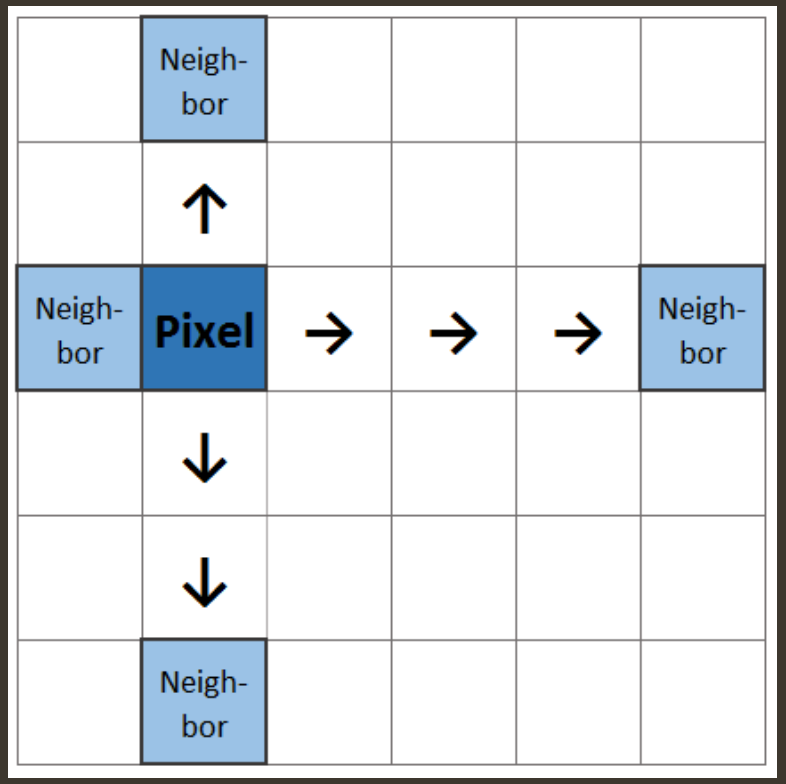
1. Data Gathering by Stencil Filtering

Von Neumann Neighborhood

- Cellular Automatons

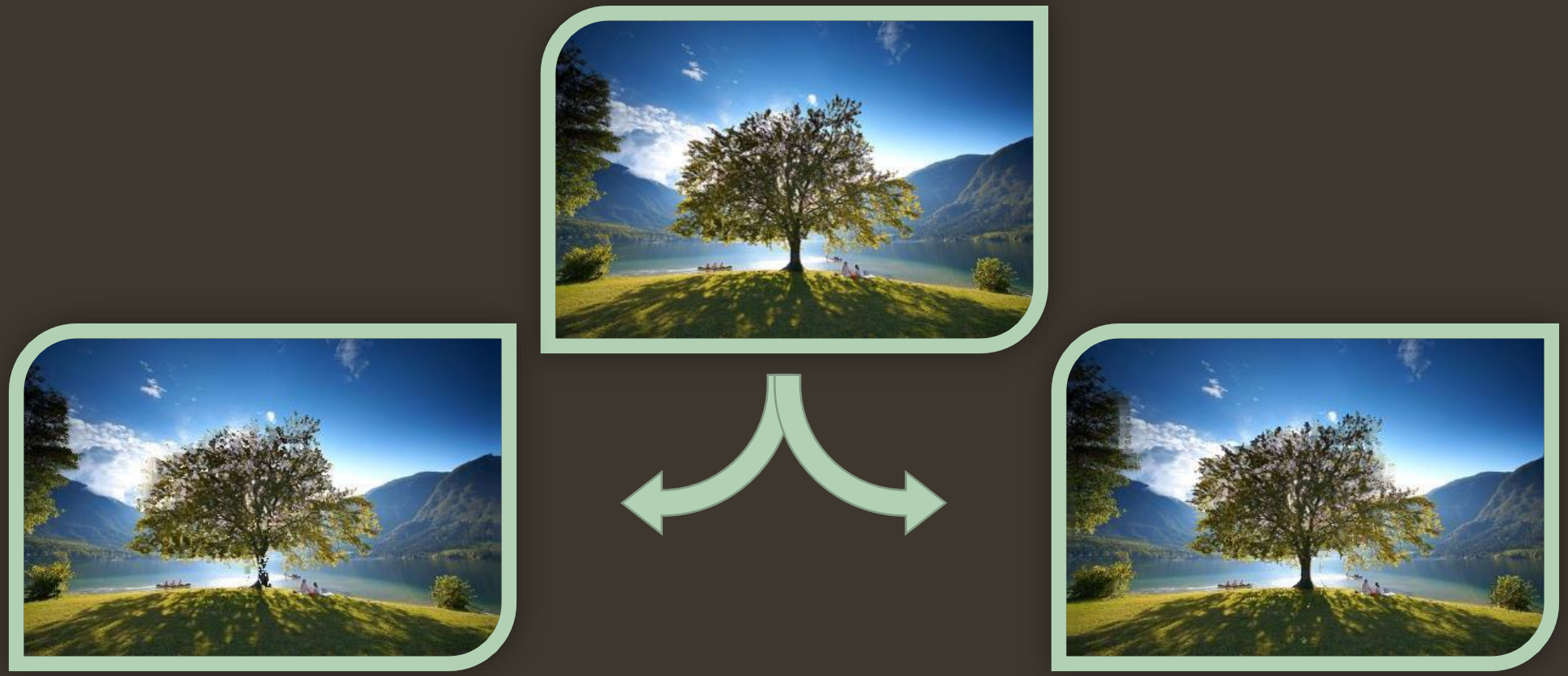


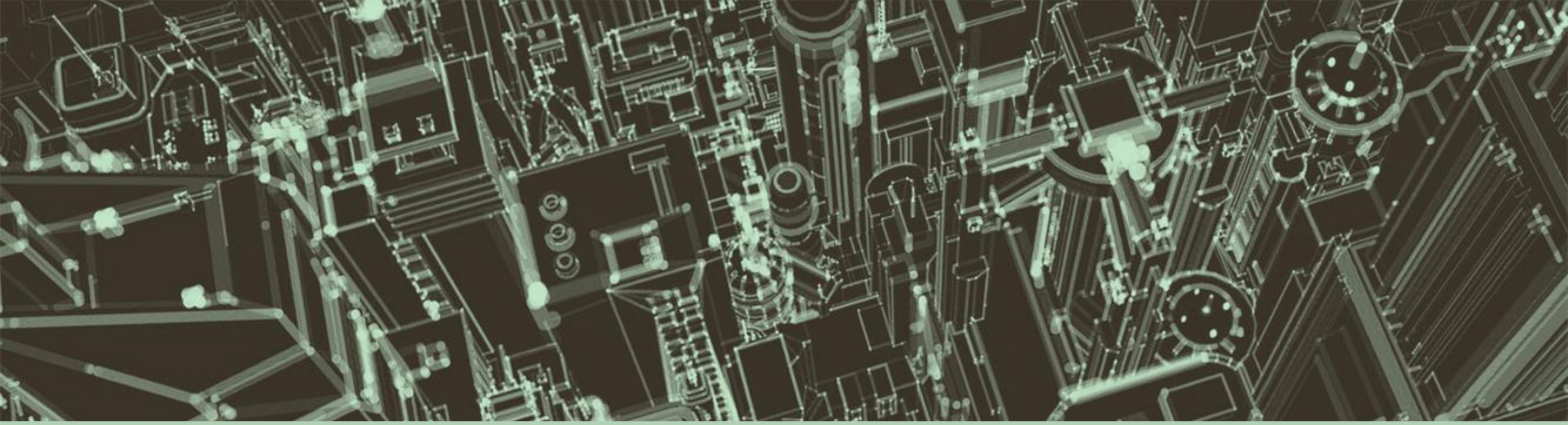
Recursive Von Neumann Stencil (RVNS)



2. Data Filtering by Median Filtering Kernel

Resulting Stereoscopic Image Pair

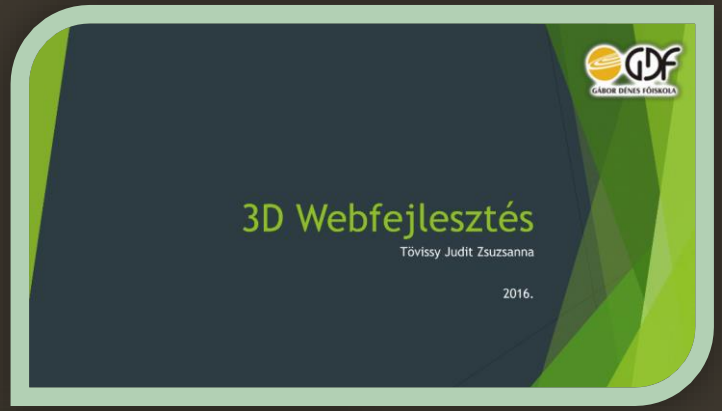




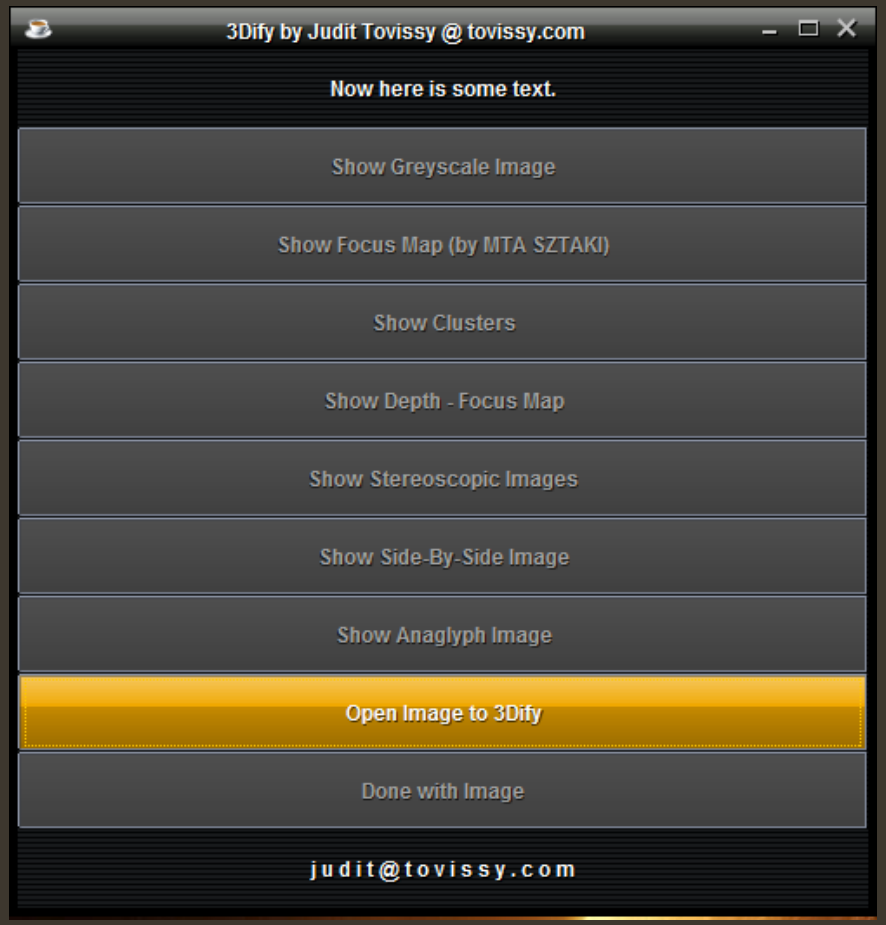
The Vision for 3Dify

Beyond Today

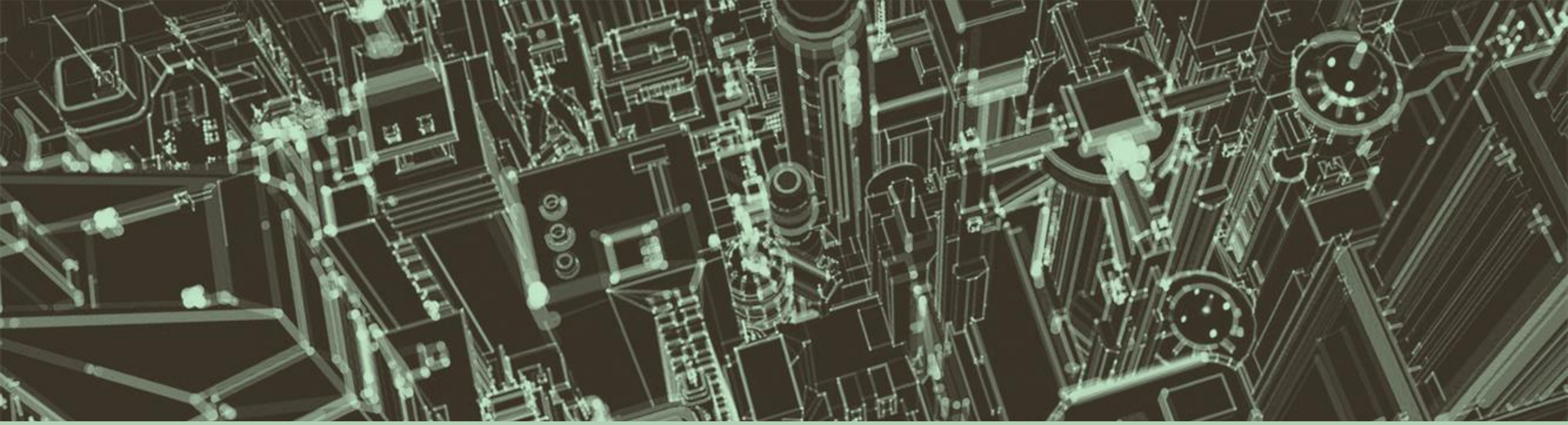
Applications of 3Dify



Next for 3Dify…



- Comparative Methods
- Configurability
- Statistical Depth Map
- Machine Learning



Thank you for your attention!

http://tovissy.com judit@tovissy.com