

Modelling Historical River Landscape Evolution in Virtual Reality (VR)

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Geomatics Master Project

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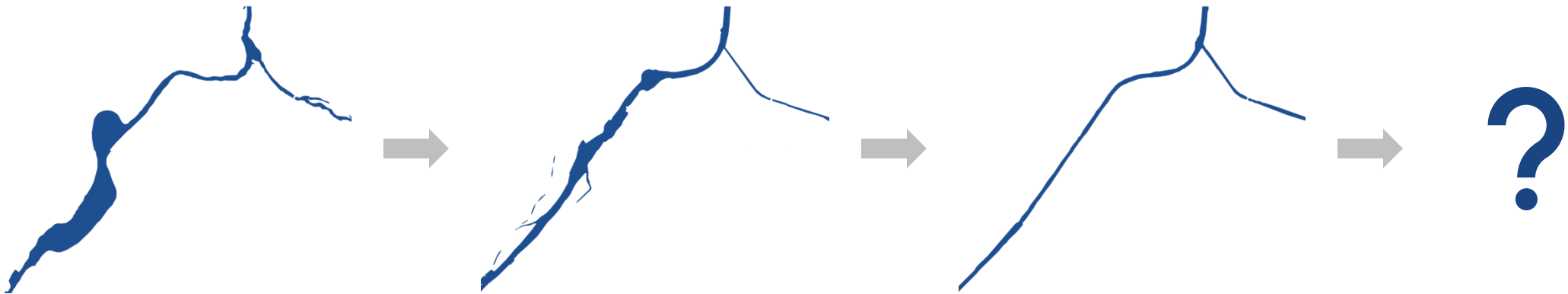


River landscapes

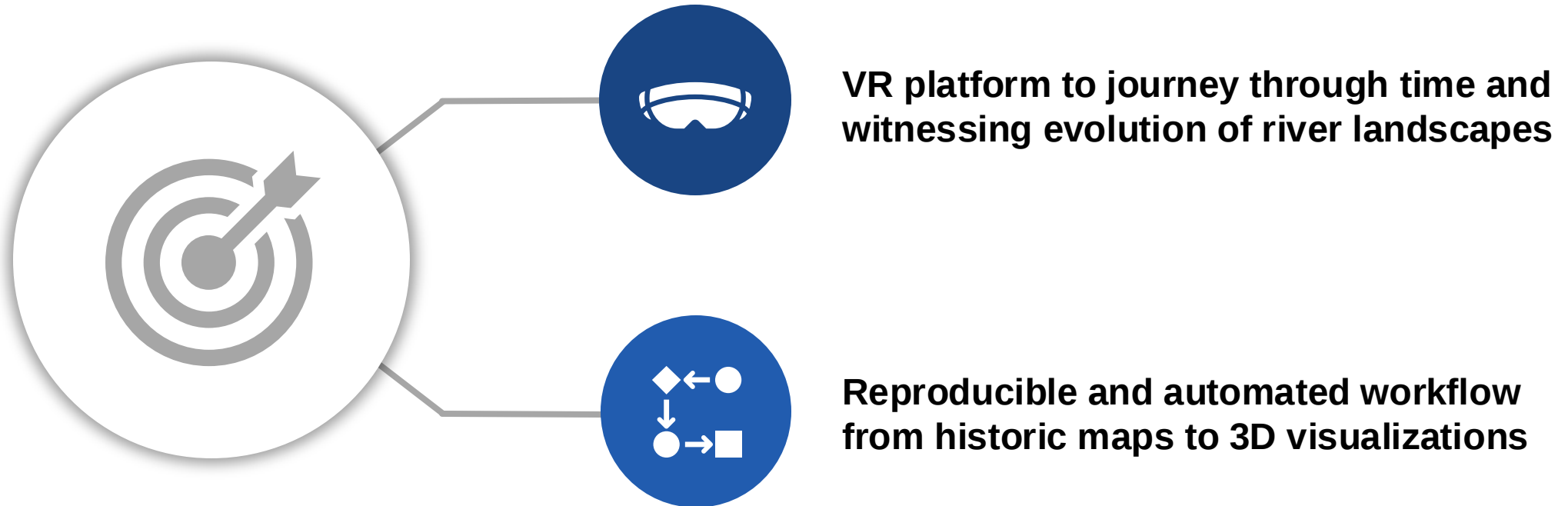
complex interaction between humans, animals and plant life

Temporal changes

insights in past, present & future of landform processes

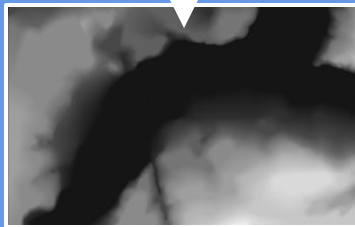
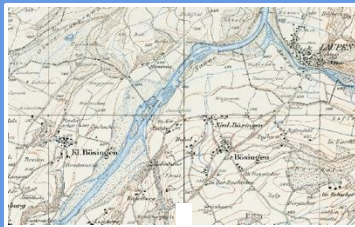


Goals

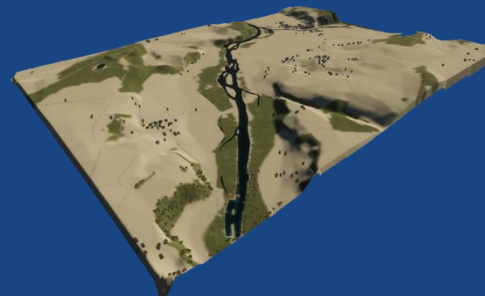




WP 1 Map to DEM



WP 2 Landscape Creation

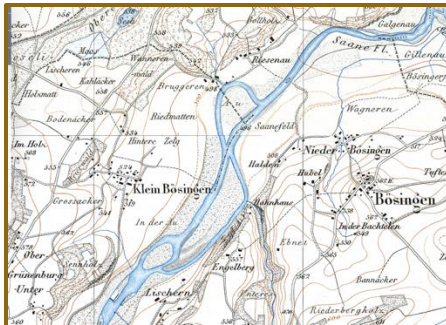
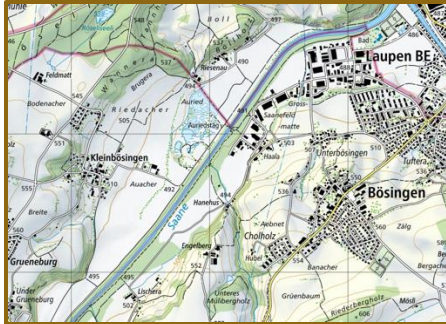


WP 3 VR Story Telling

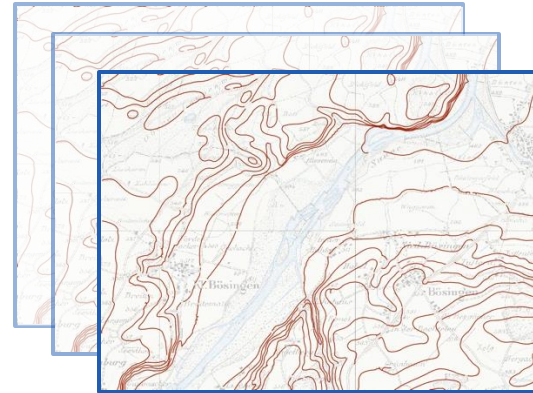


Method – Map to DEM

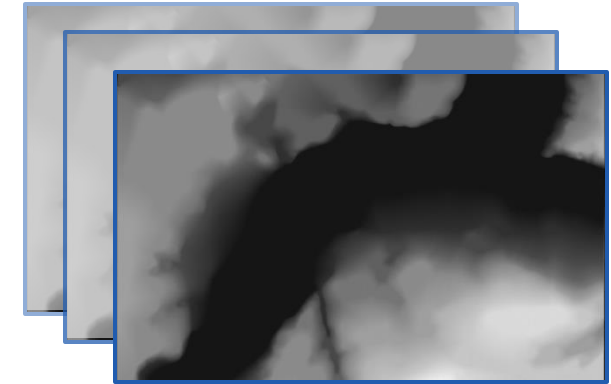
Historic national maps



1870, 1878, ..., 1975, 1987



Contour Line Extraction



DEM from Grid Interpolation

- Input Data
- Intermediate Results of Python Processes

Method – Landscape Creation

Texture samples



Provided annotation vector data



Texture
synthesis

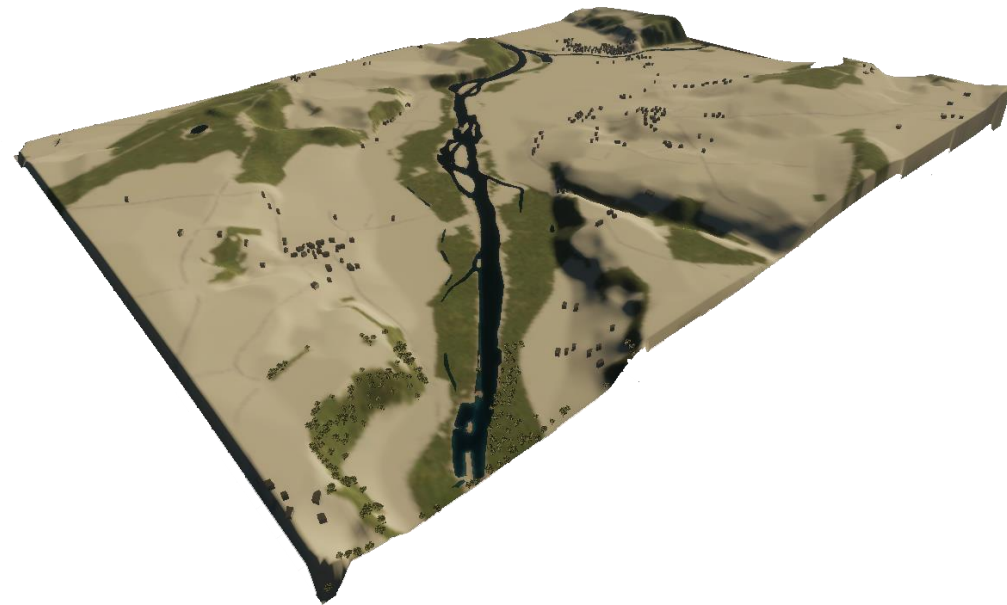
Mask
clipping



Method – Landscape Creation



- Unity Package *GIS Terrain Loader Pro*
- C# Scripts
- HDRP Renderpipeline



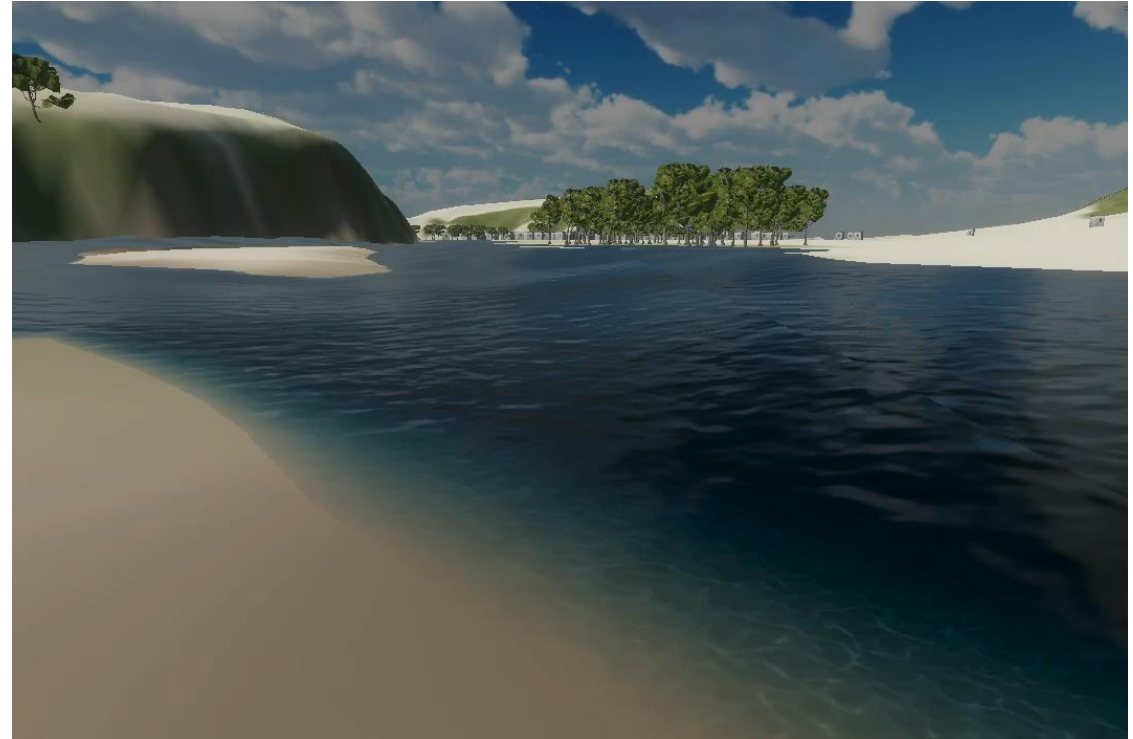
[1] https://de.wikipedia.org/wiki/Unity_%28Spiel-Engine%29

Method – Landscape Creation

Introduction ● | Goals ● | Method ● ● ● ● ● | Results ● | Discussion & Outlook ●



- Unity Package *GIS Terrain Loader Pro*
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[1] https://de.wikipedia.org/wiki/Unity_%28Spiel-Engine%29

Method – VR Story Telling



- Unity XR Interaction Toolkits
- Meta Quest 3S & Meta Quest Pro



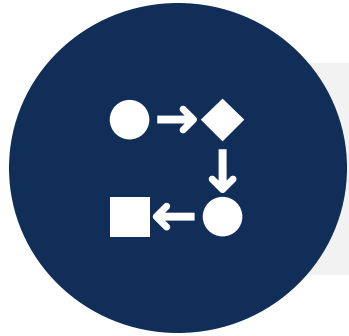
[1] https://de.wikipedia.org/wiki/Unity_%28Spiel-Engine%29

[2] <https://www.de.fhn.ch/Meta-Quest-3S-128-GB-Virtual-Reality-Headset-Mixed-Reality-Headset-Weiss/a20783624>

Results

Introduction ● | Goals ● | Method ●●●●● | Results ● | Discussion & Outlook ●





automated **Workflow**:
apart from few manual steps, automated
workflow for creating 3D landscapes



Improve automation
Reduce manual steps



perceiving **temporal changes**:
Bird view & full-scale environment



User study
on the effectiveness of this
visualisation method





Thank You

You are warmly invited to visit my poster and immerse yourself in the virtual world.



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