

Computational Photography

- * Study the basics of computation and its impact on the entire workflow of photography, from capturing, manipulating and collaborating on, and sharing photographs.



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Panoramic Video Textures

- * Combine Video Textures and Panorama



Lesson Objectives

1. Review Video Textures and Panoramas
2. Combine Video Textures and Panoramas to form Panoramic Video Textures
3. Construct a Panorama from Video
4. Construct a Video Texture from Dynamic parts of the scene

Panoramic Video Textures



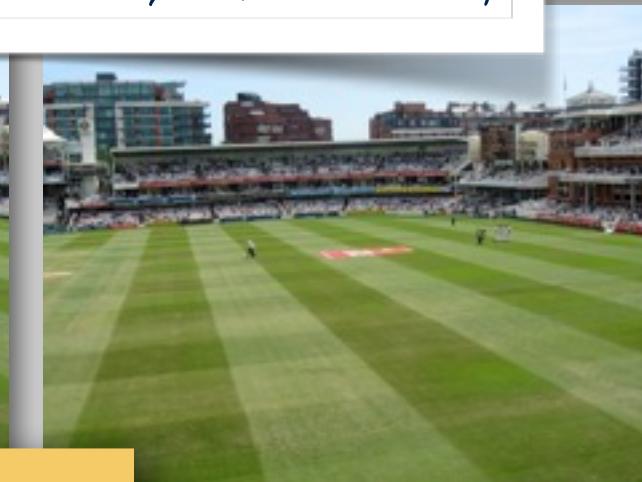
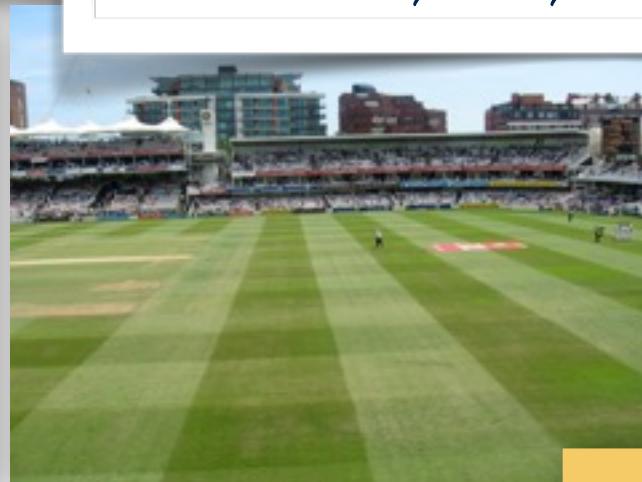
- * A panoramic video texture (PVT)
- * A video that has been stitched into a single, wide field of view
- * Appears to play continuously and indefinitely

Agarwala, Zheng, Pal, Agrawala, Cohen, Curless, Salesin, Szeliski (2005) "Panoramic Video Textures" SIGGRAPH 2005

Recall: Panoramas



7 Pictures, / $3,072 \times 2,304$ (7IMP)



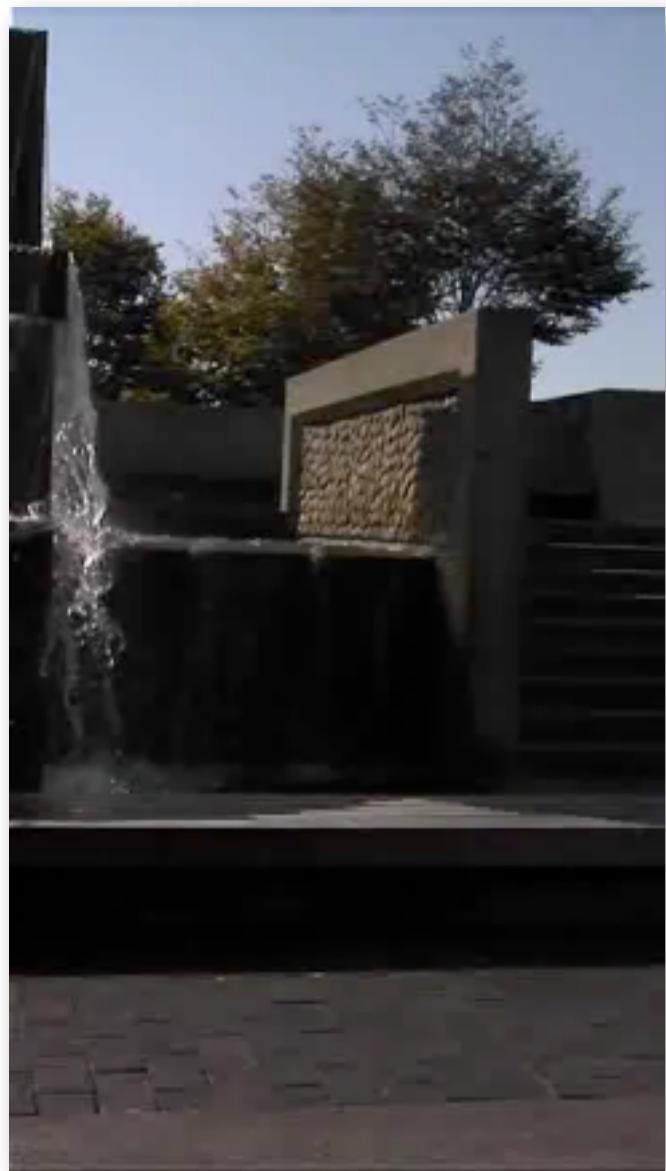
$11,262 \times 2,691$ / (31 MP) / FOV=151.72 \times 24.46

Recall: Video Texture

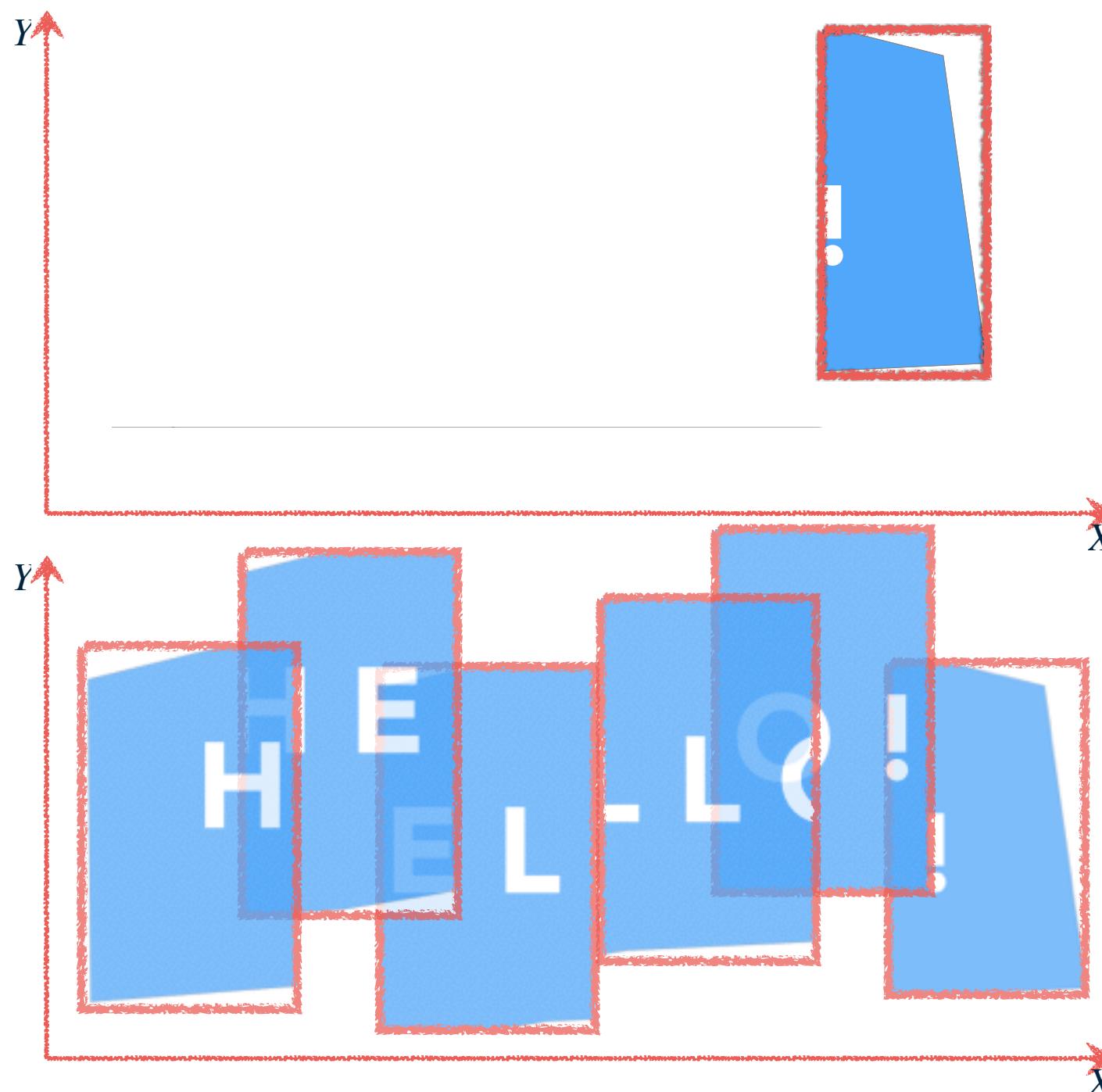


(Schödl, Salesin, Szelsiki, Essa 2003)

Panoramic Video Textures

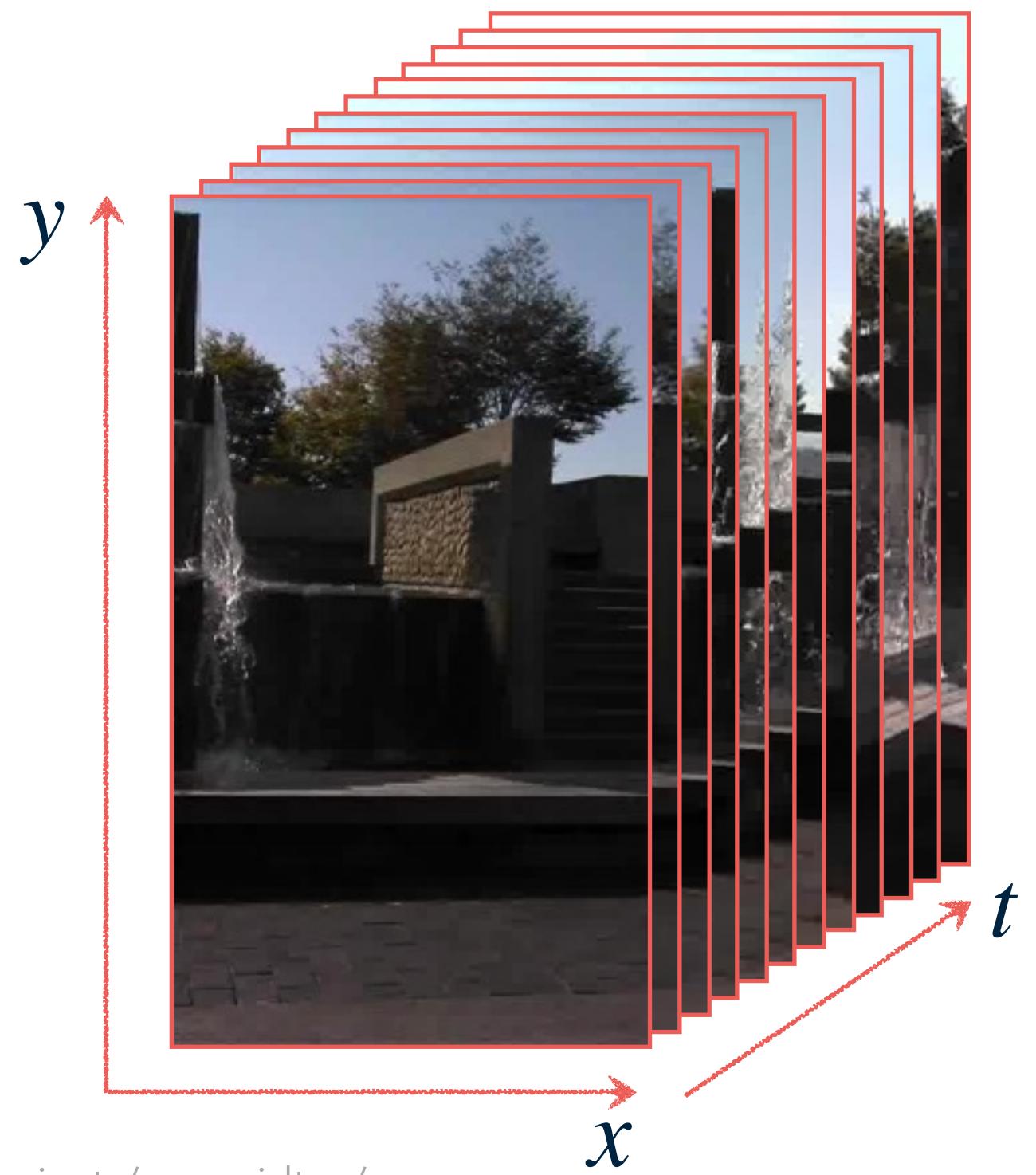
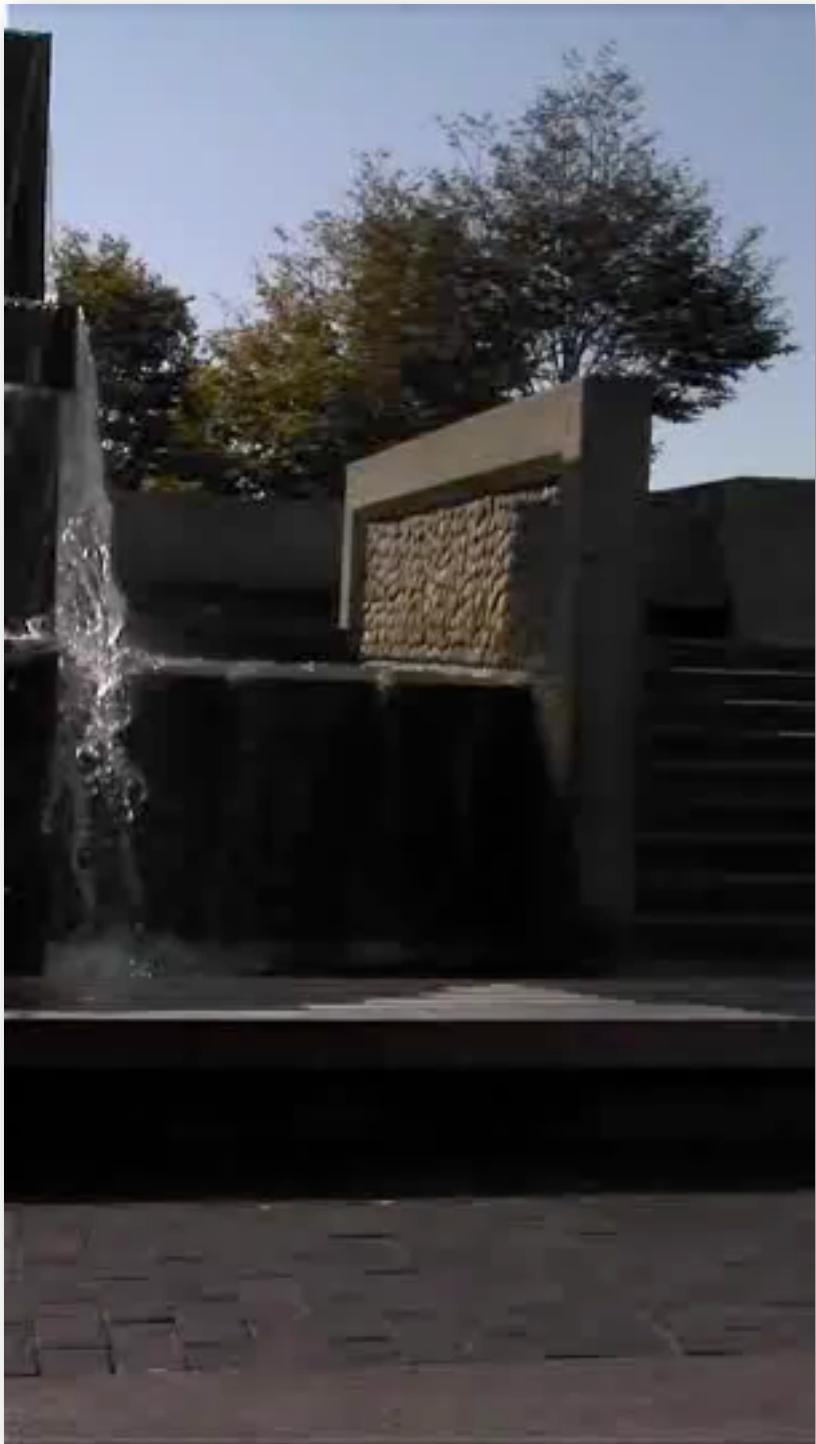


Video Pan to a Panorama?



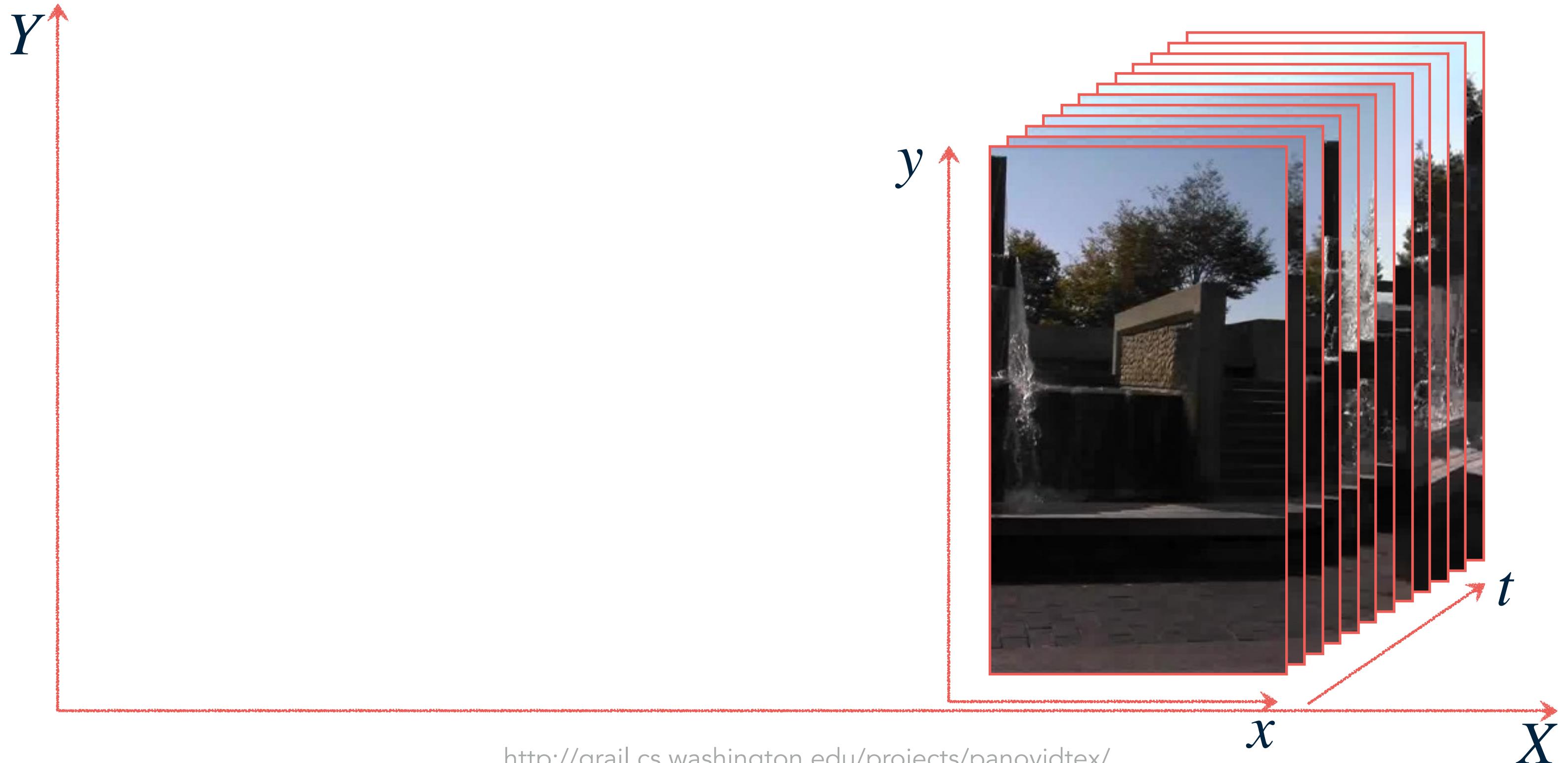
- Use all the video frame, register and align to generate panorama
- Take select 6 images and generate panorama
- Both

Video Registration



<http://grail.cs.washington.edu/projects/panovidtex/>

Video Registration



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Video Registration

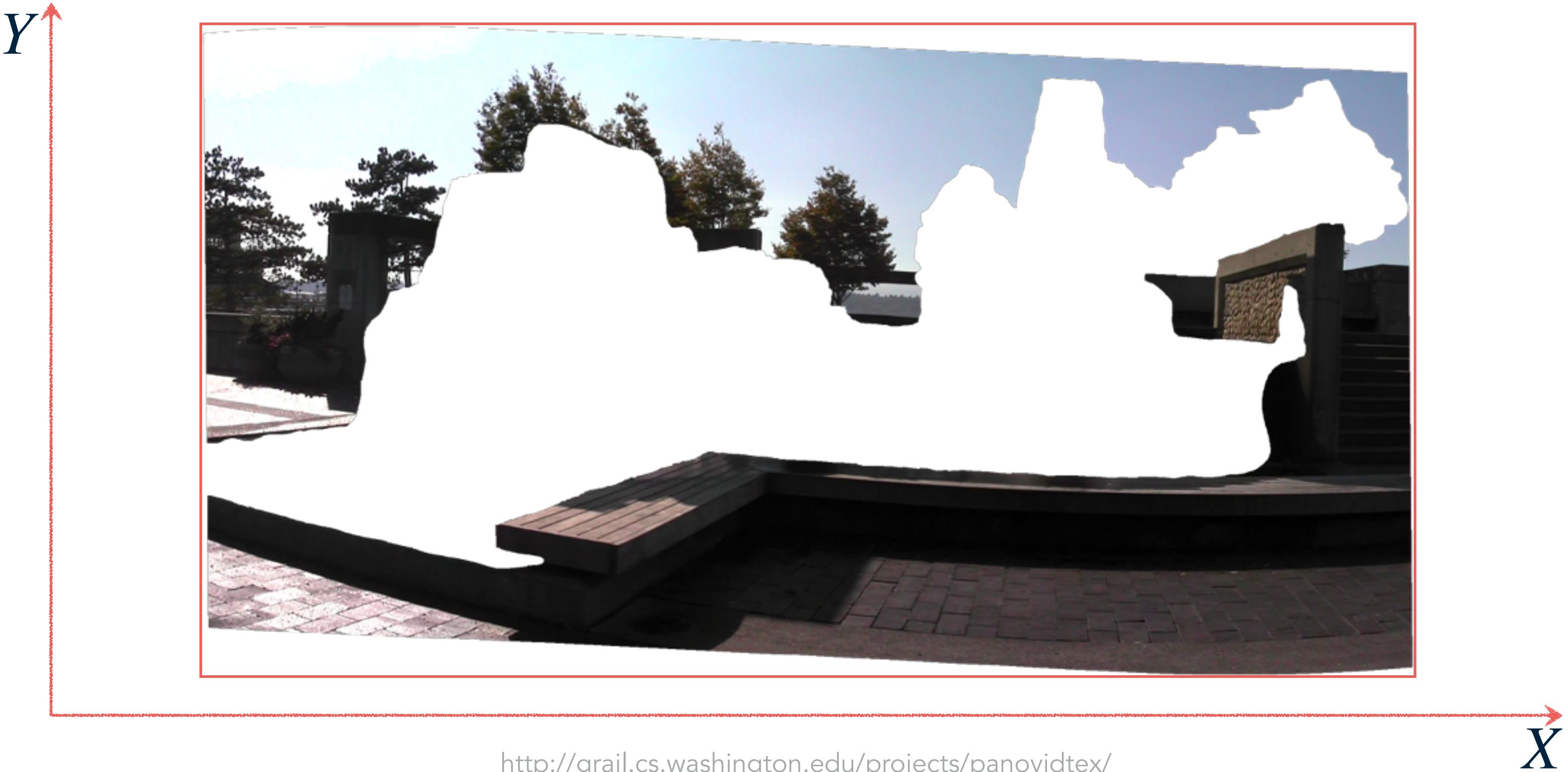
Y



X

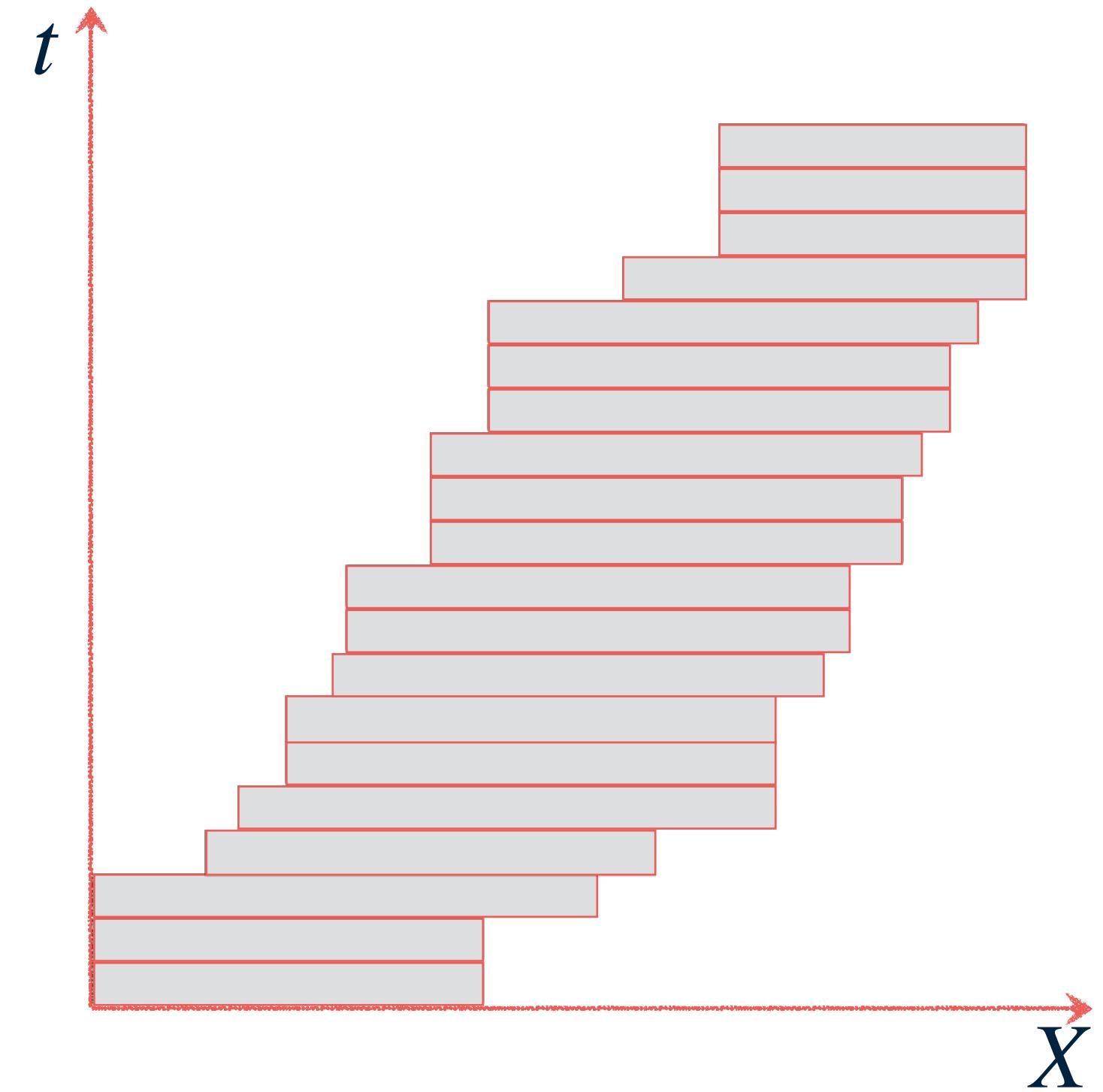
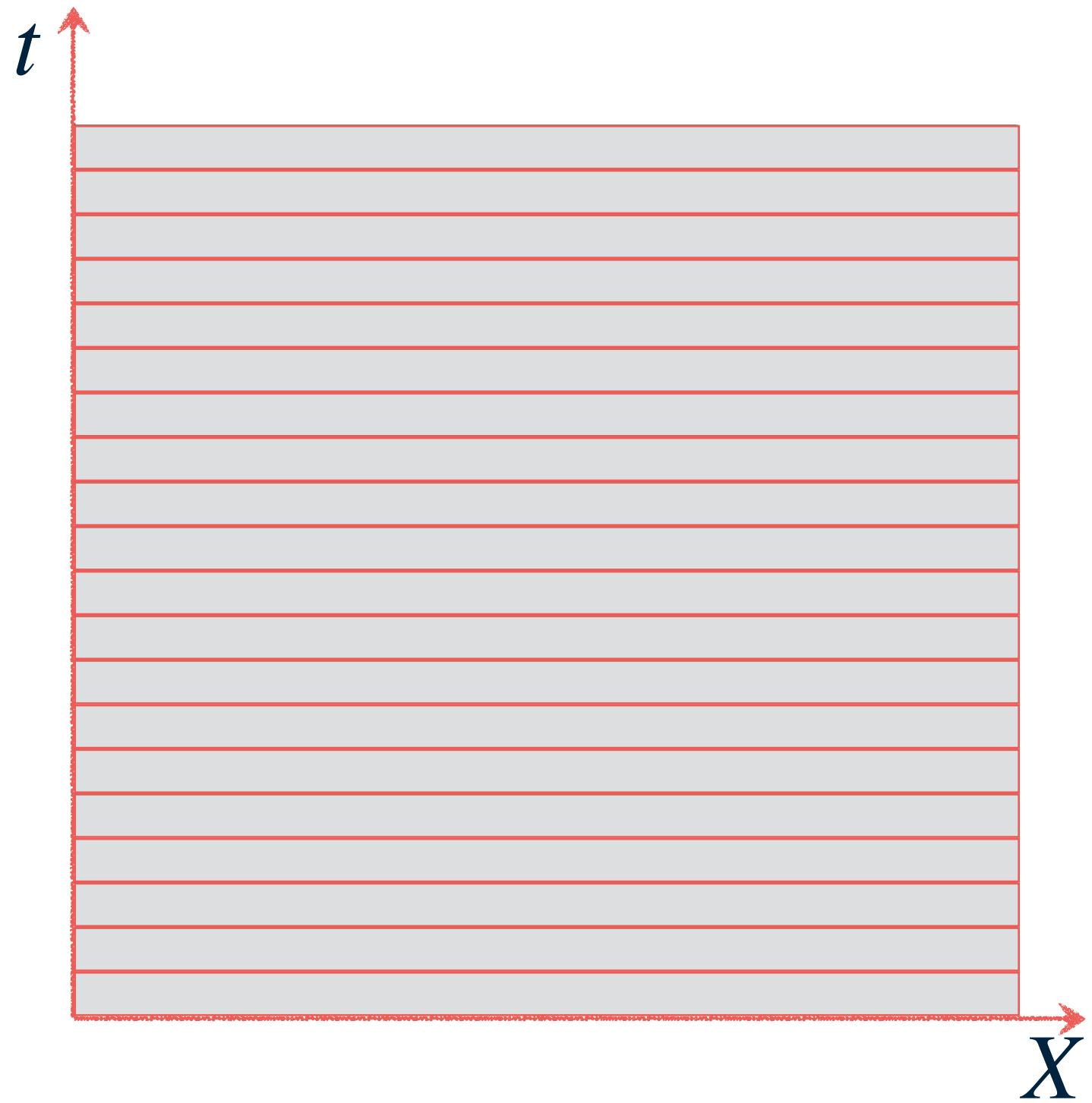
<http://grail.cs.washington.edu/projects/panovidtex/>

Static vs. Dynamic Regions

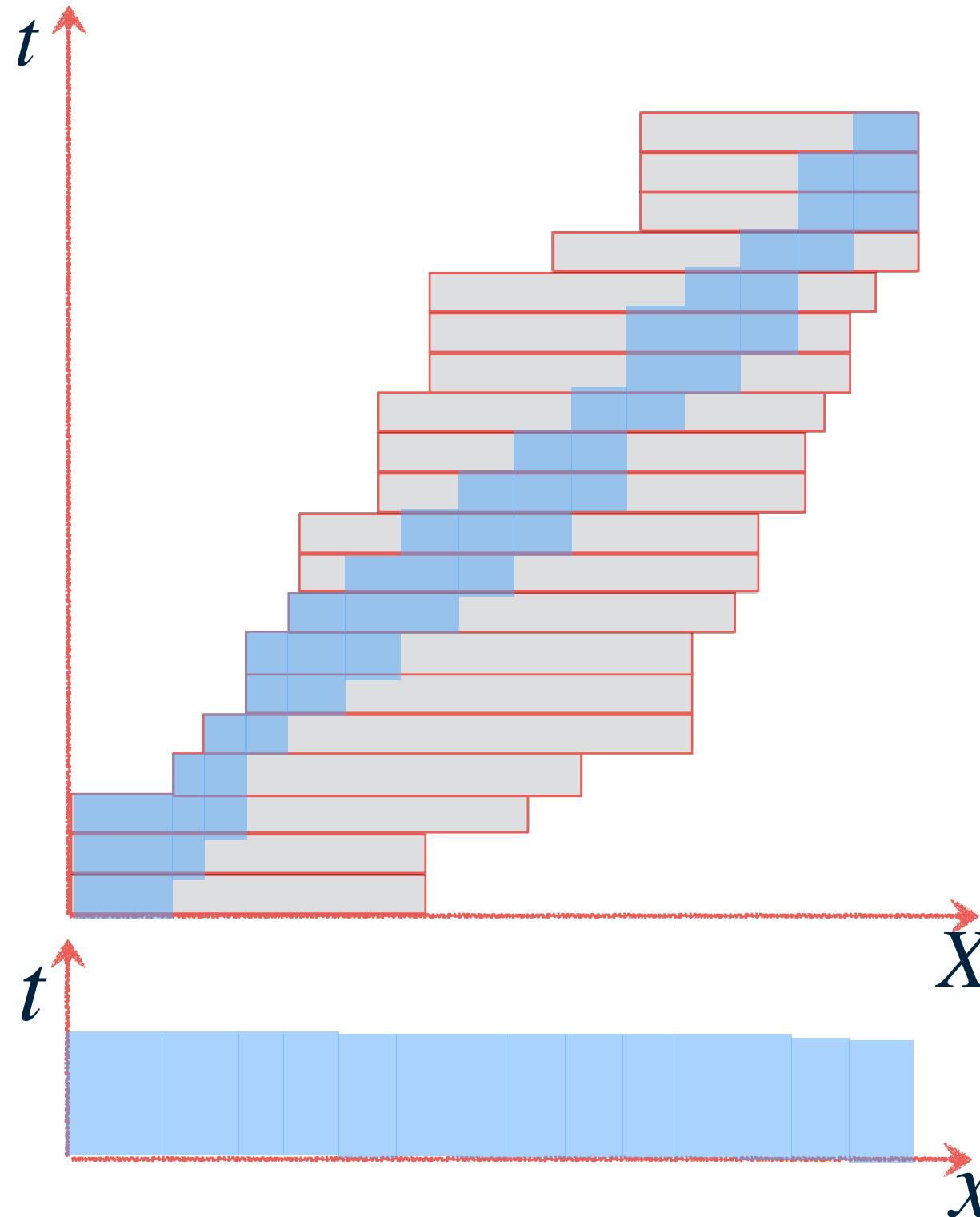


<http://grail.cs.washington.edu/projects/panovidtex/>

Video Features of Dynamic Regions



Video Features of Dynamic Regions



- * Map a continuous diagonal slice of the input video volume to the output panorama
- * Restricts boundaries to frames
- * Shears spatial structures across time

Video Features of Dynamic Regions

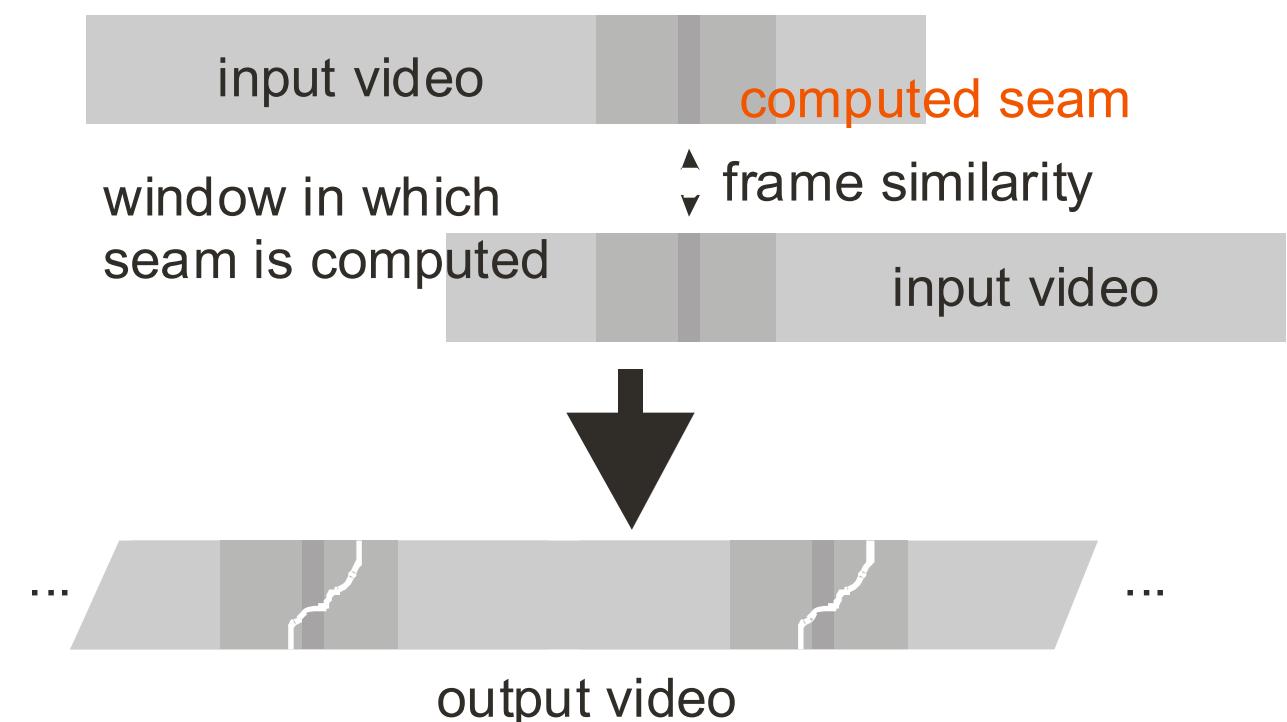
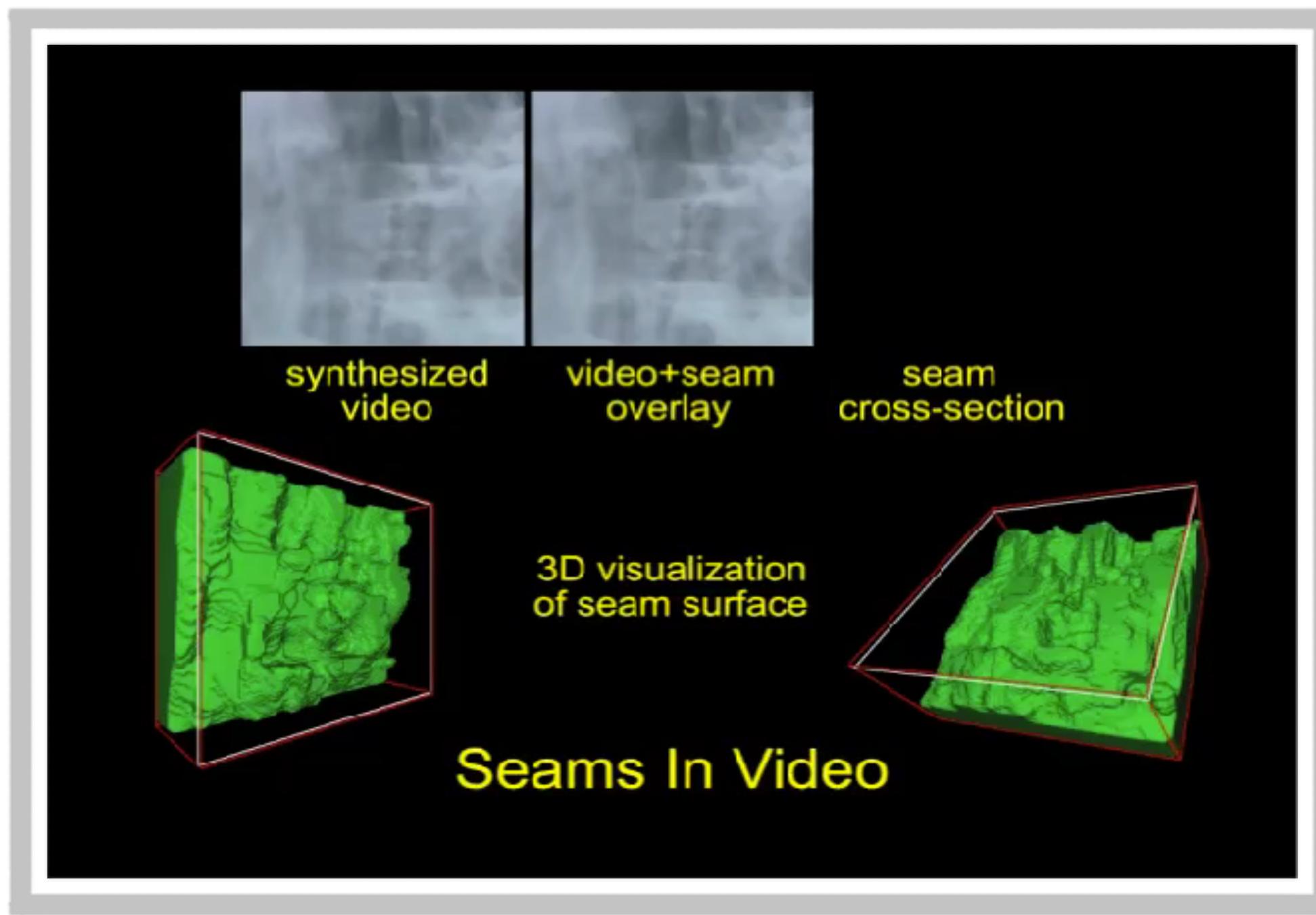


Original



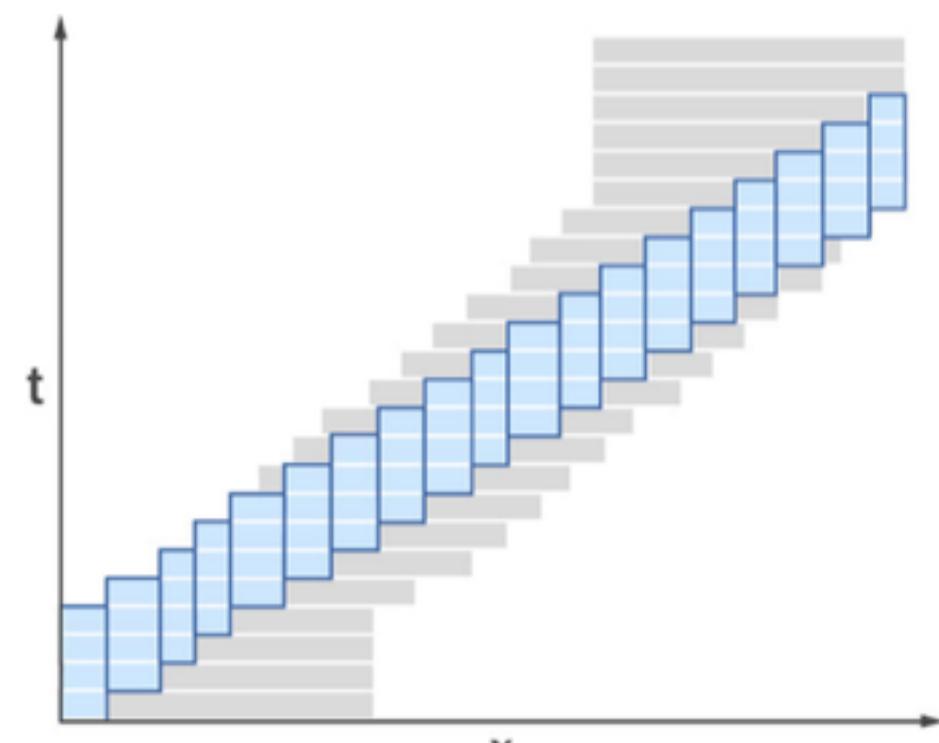
Continuous Diagonal Slices

Not Just Fade/Blend, but Cut

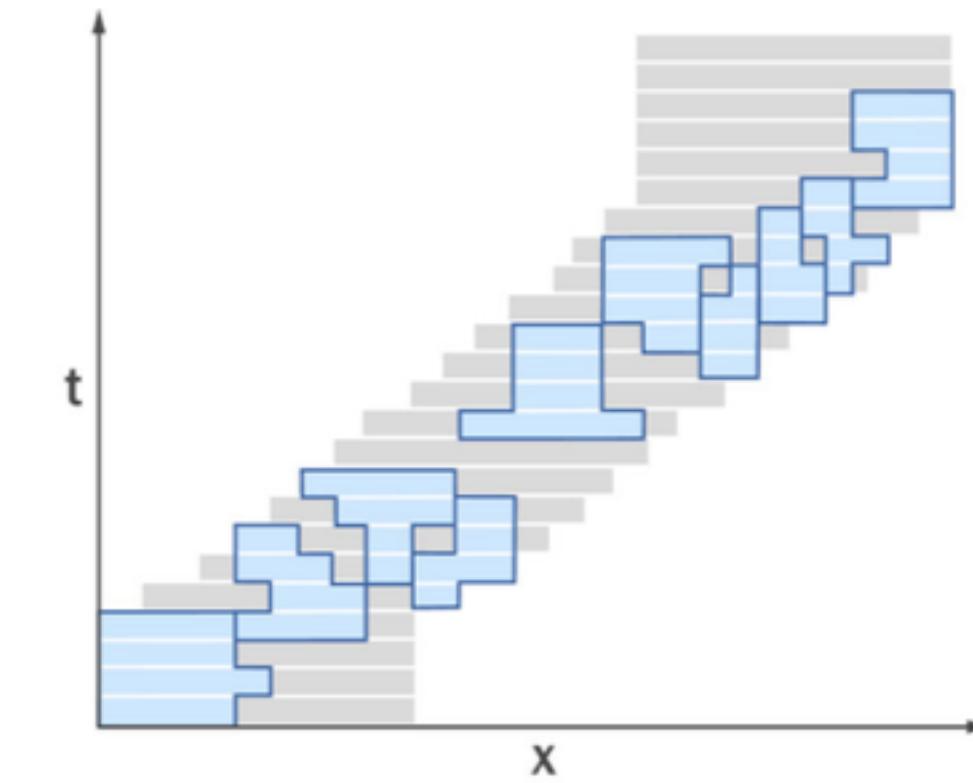


(Kwatra, Schödl, Essa 2003)

Video Features of Dynamic Regions



Map a continuous diagonal slice
of the input video volume



Mapped to locations in the
input in coherent fragments

Video Features of Dynamic Regions



Original



Coherent Fragments



Summary



- * Introduced the concept
of Panoramic Video
Textures
- * Extension of Video
Textures and Panoramas

Further Reading



- * Agarwala, Zheng, Pal, Agrawala, Cohen, Curless, Salesin, Szeliski (2005) "Panoramic Video Textures" > SIGGRAPH 2005 [[PDF](#)]
- * Schödl, Szeliski, Salesin, and Essa (2000), "Video textures," in SIGGRAPH 2000 [[PDF](#)]
- * Kwatra, Schödl, Essa, Turk, Bobick (2003), "Graphcut textures: image and video synthesis using graph cuts" in SIGGRAPH 2003 [[PDF](#)]

Credits



- * For more information, see
- * Agarwala, Zheng, Pal, Agrawala, Cohen, Curless, Salesin, Szeliski (2005) "Panoramic Video Textures" SIGGRAPH 2005
- * <http://grail.cs.washington.edu/projects/panovidtex/>

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