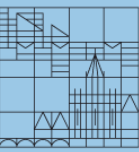


Markerless Tracking

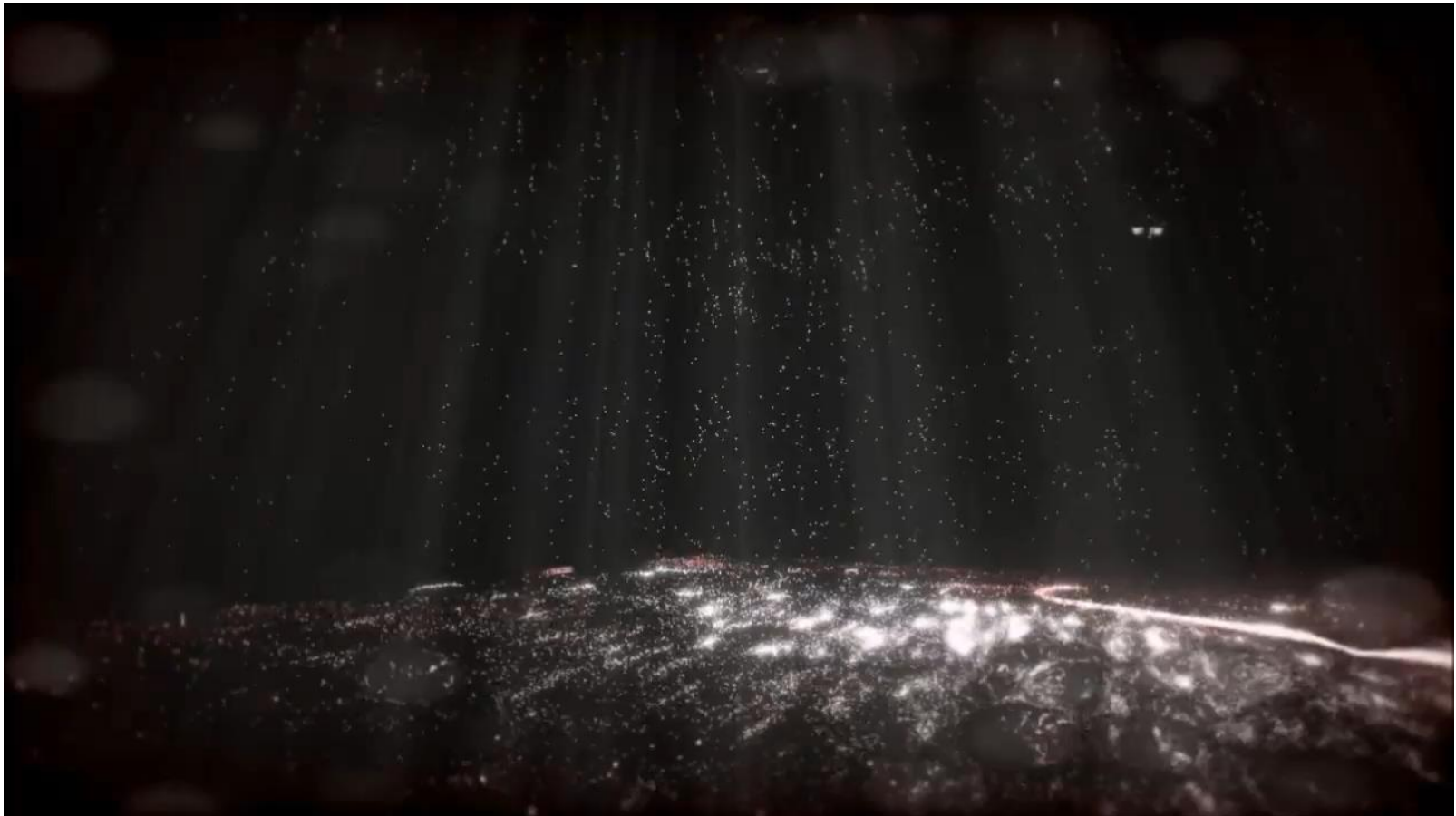
Future challenges and trends in HCI - Physical
Prototyping - Hardware Sketching

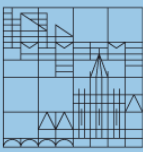
Moritz Skowronski, Daniel Fink

Summer Term 2014



Video Example





- In this seminar
- What to consider
- How to get the camera working
- Markerless Tracking
 - Colortracking
 - Facetracking
 - Blobtracking (Multitouch)



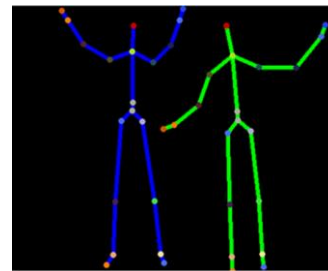
- Markerless Tracking



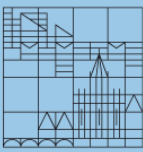
- Markertracking



- Gesturetracking



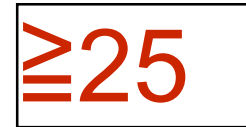
What to consider



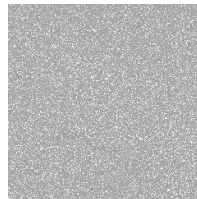
Illumination



Framerate



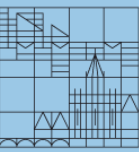
Noise



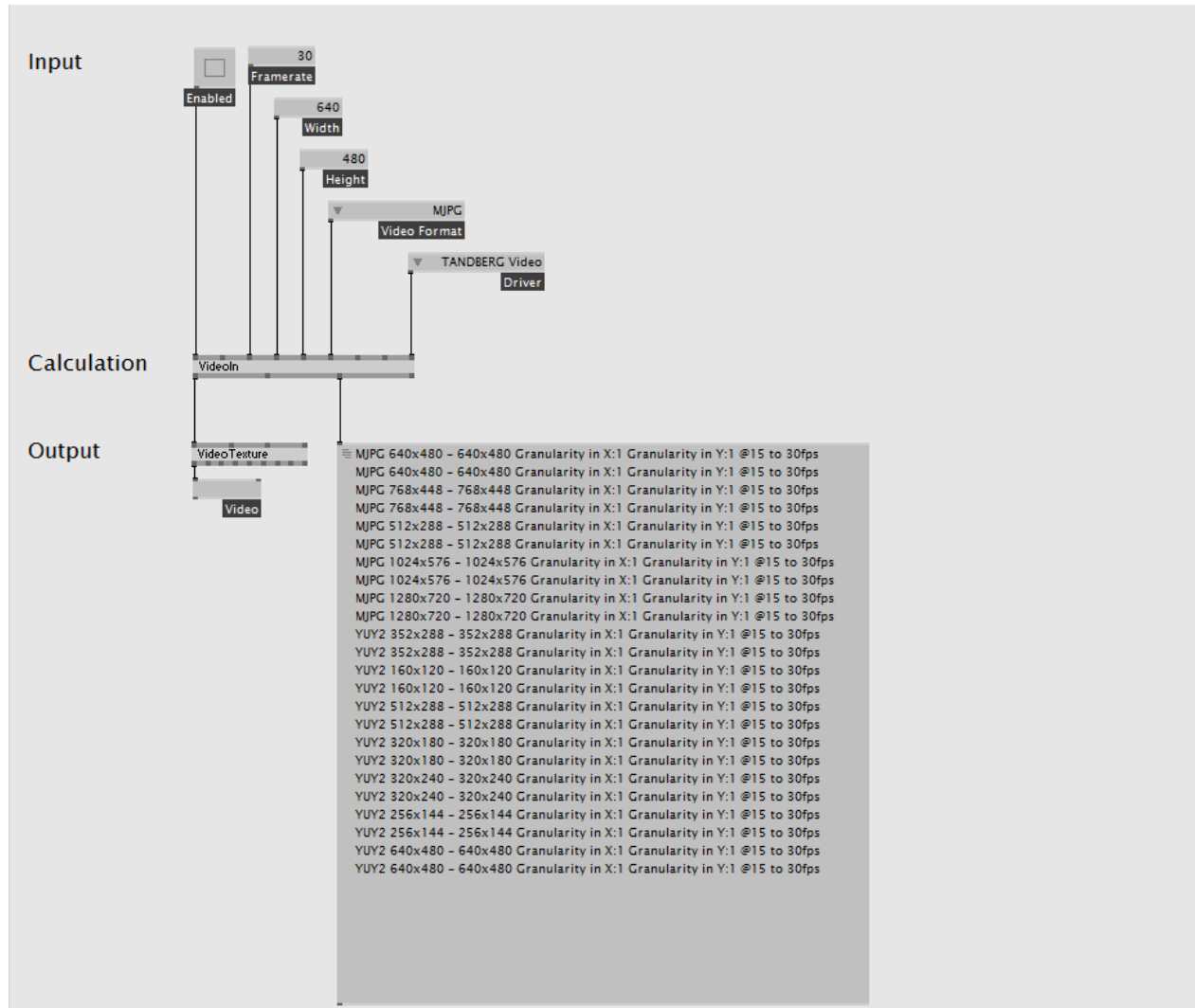
Resolution

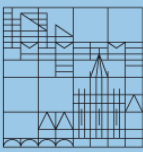


What to consider

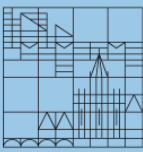


How to get the camera working





Colortracking



Facetracking



Facetracking is a technique that detects the position and size of a human face in digital images or videos.

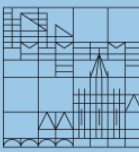
Also possible:

- age and gender recognition
- distinguish a person from another person

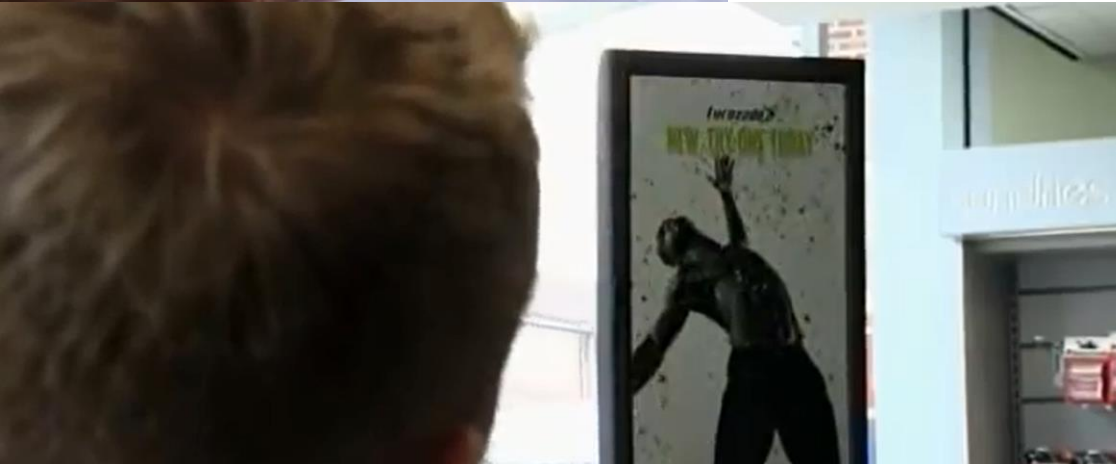
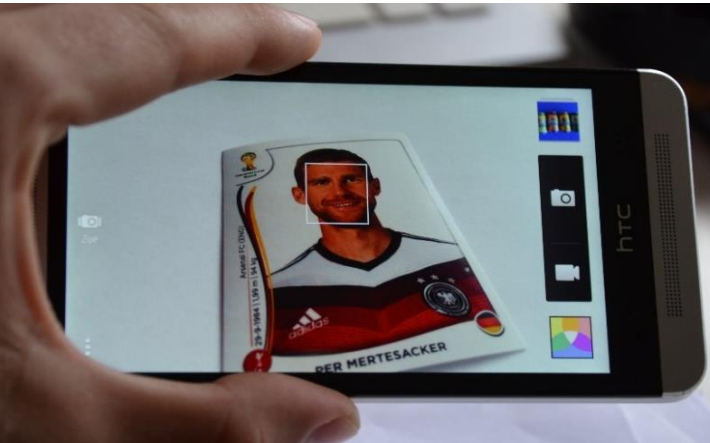


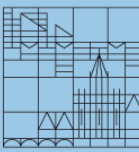
How it works:

- need a camera
- an object detector (in VVVV DetectObject node) returns position and size of an object
- need a trainingsfile for faces
- better resolution = better tracking
- near distance to camera = better tracking



Examples





Patch: Photo Booth

_root.v4p * C:\Users\Daniel\Desktop\5_3_Facetracking_latest\

PROTOTYPING INTERFACES
INTERACTIVE SKETCHING WITH VVVV

ISBN: 9783874398435
First Edition, Verlag Hermann Schmidt Mainz, 2013
prototypinginterfaces.com

DEVELOPED WITH:	5_3_Facetracking	COPYRIGHT 2013	LICENSED UNDER:
45beta31.2 2013	Trigger a phot application with the position of your head	Jan Barth Roman Grasy Jochen Leimberger Mark Lukas Markus Lorenz Schilling	Apache License, Version 2.0 http://www.apache.org/licenses/LICENSE-2.0

Input

Save this patch always with the camera turned off. Otherwise the patch will crash sometimes while opening. >>

Replace the simulation video signal with your camera signal here (right click on Facetracking). >>

Calculati...

Renderer



Blobtracking

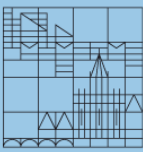
(Multitouch)



What is Blobtracking?

Blob is a collection of pixels in an image in which some properties are constant.

Blobtracking is a technique to detect regions (Blobs) in digital images that differ in properties compared to the surroundings.



Why do we need Blobtracking?

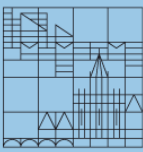
- Markertracking (Fiducial-Tracking)
- Multitouch



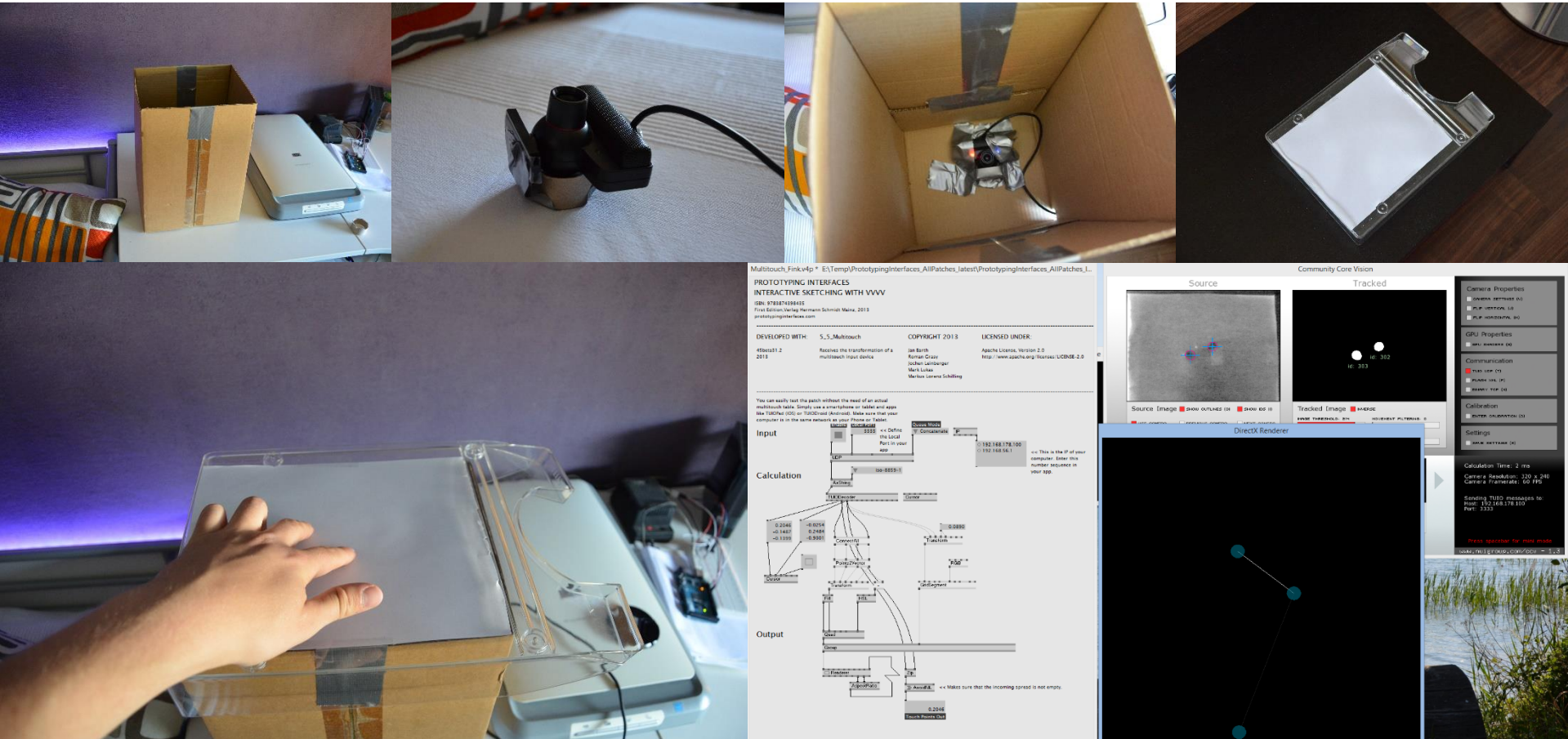
Multitouch

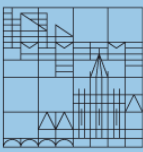
- handle a device with two or more inputs (finger) at once
- very natural way of interacting with devices
- Multitouchscreens: very direct interacting because input device and output device are the same

Blobtracking

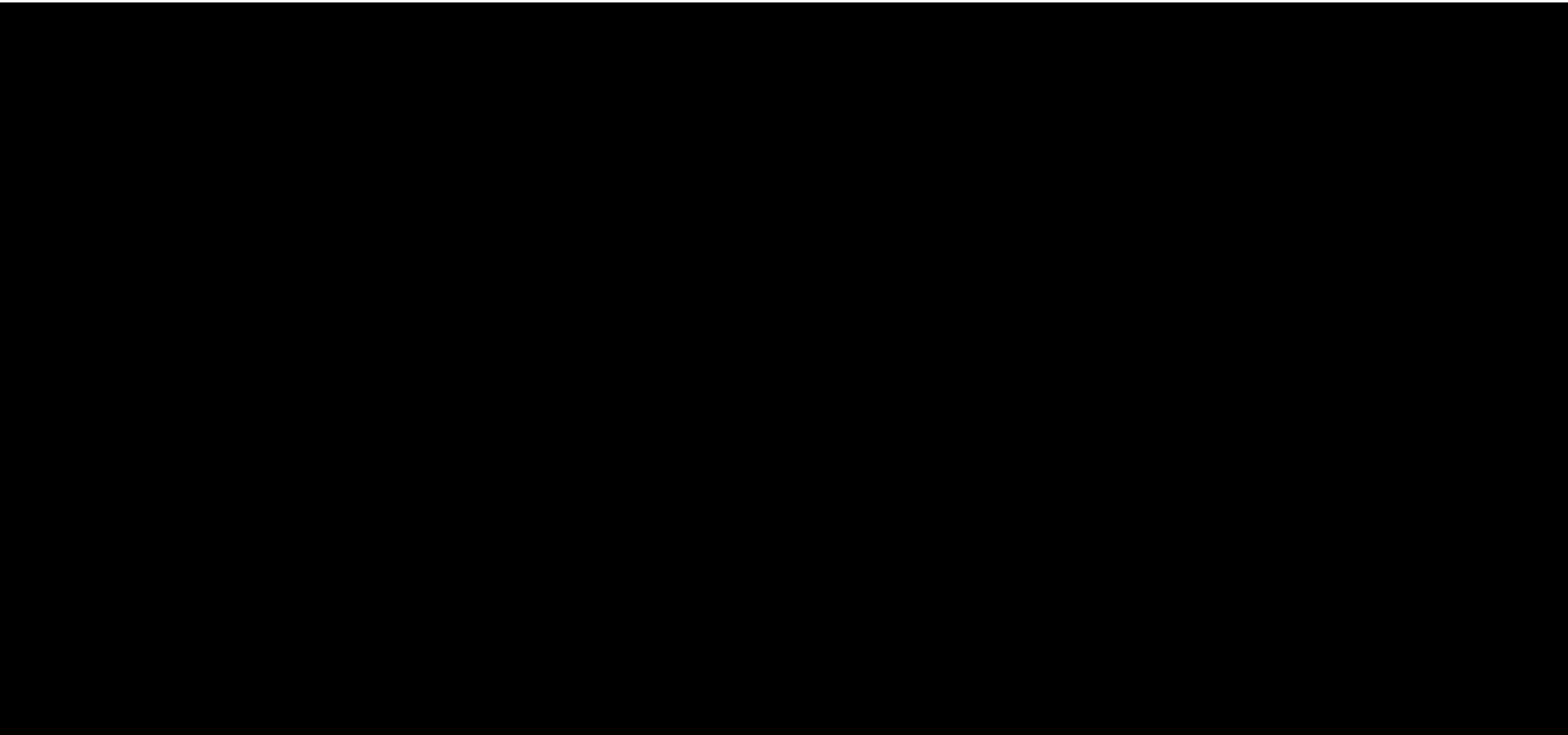


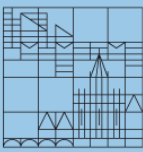
Patch: Trackpad





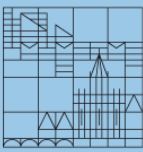
Video Example: Multitouch Table





- **Prototyping Interfaces: Interaktives Skizzieren Mit VVVV**
Jan Barth, Roman Stefan Grasy, Martin Lukas, Jochen Leinberger, Markus Lorenz Schilling (2013)
Schmidt Hermann Verlag
- **Blob Detection**
http://en.wikipedia.org/wiki/Blob_detection (13.06.2014, 8:45)
- http://www.koewe.de/uploads/tx_cbshops/fotoautomat-bild.jpg
- <http://www.amscreen.eu/optimeyes-real-time-insight-for-digital-media-advertising>
- <http://www.youtube.com/watch?v=sJU8sBt7eC8>
- <http://vimeo.com/52612788>
- http://fc09.deviantart.net/fs21/f/2007/275/0/6/Face_Illumination_by_E_mune.jpg
- http://3.bp.blogspot.com/-eJ_7uGF69QU/UzoUZO3FcGI/AAAAAAAAADGA/wnS3iuZMY4g/s1600/garden-state-wallpaper-990x611.jpg
- http://www.henner.info/bearb/Henner_2.jpg

List of references



- http://greenlanternpress.files.wordpress.com/2010/06/white_noise.jpg
- <http://www.codeproject.com/KB/dotnet/KinectGettingStarted/8.png>
- <http://www02.zkm.de/you/img/reactable.jpg>
- <http://vvvv.org/sites/default/files/imagecache/large/post%20mortem%20mirror.jpg>
- <http://vvvv.org/contribution/drawsmooth-%28dx9%29>