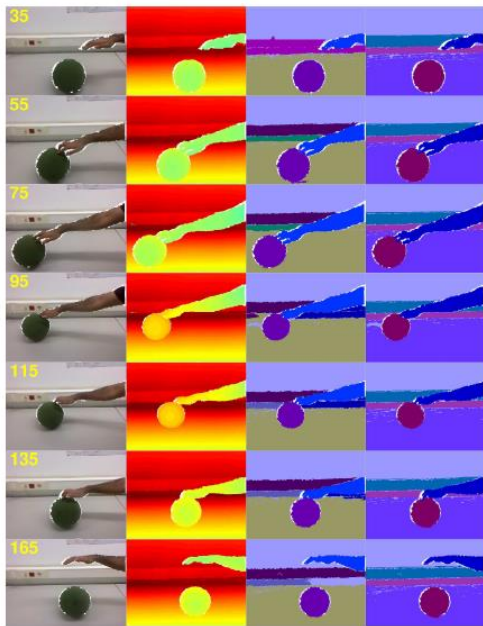


Computation of local image properties with neural networks

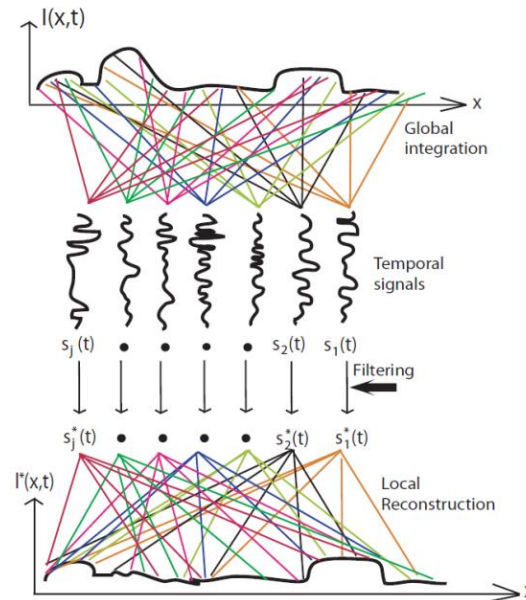
Babette Dellen, Fachbereich Mathematik und Technik, RheinAhrCampus der Hochschule Koblenz

Research interests:

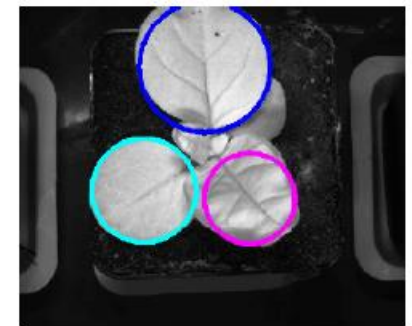
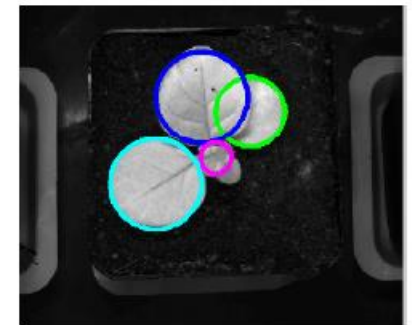
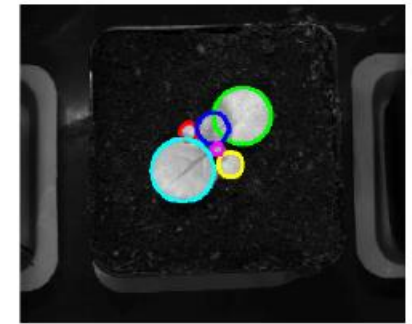
- Computation of local image properties (disparity, optic flow)
- Image and video segmentation (including depth images)
- Semantic analysis of scenes (closing the perception - action loop)
- Biological vision, neural networks and machine learning



Consistent depth video segmentation using adaptive surface models
Husain, Dellen, Torras, IEEE Transactions on Cybernetics, 2015

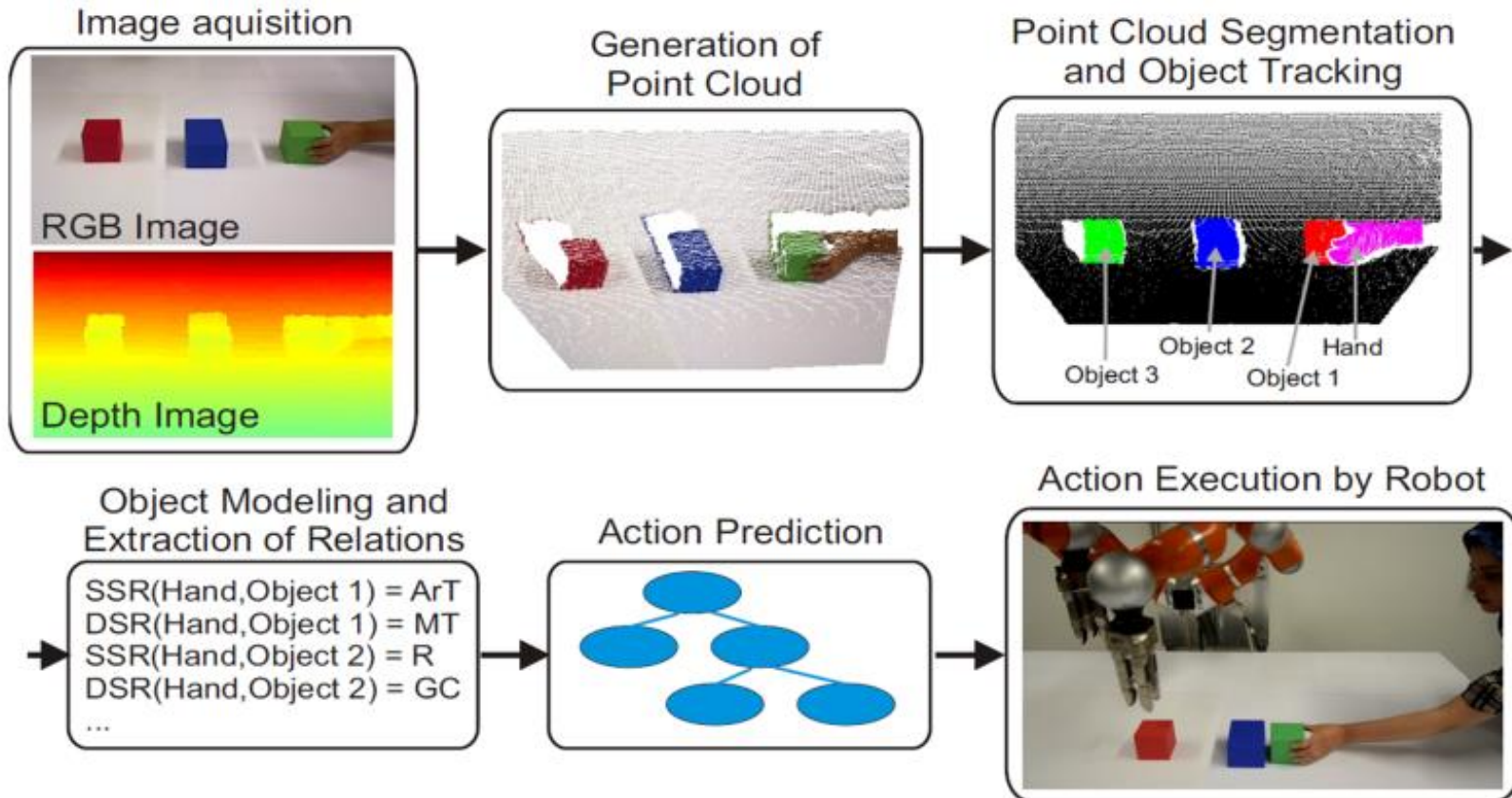


Local stimulus disambiguation with global motion filters predicts adaptive surround modulation, Dellen, Torras, Neural Networks, 2013



Automatic measurement of plant-growth curves

Closing the Perception-Action Loop ...

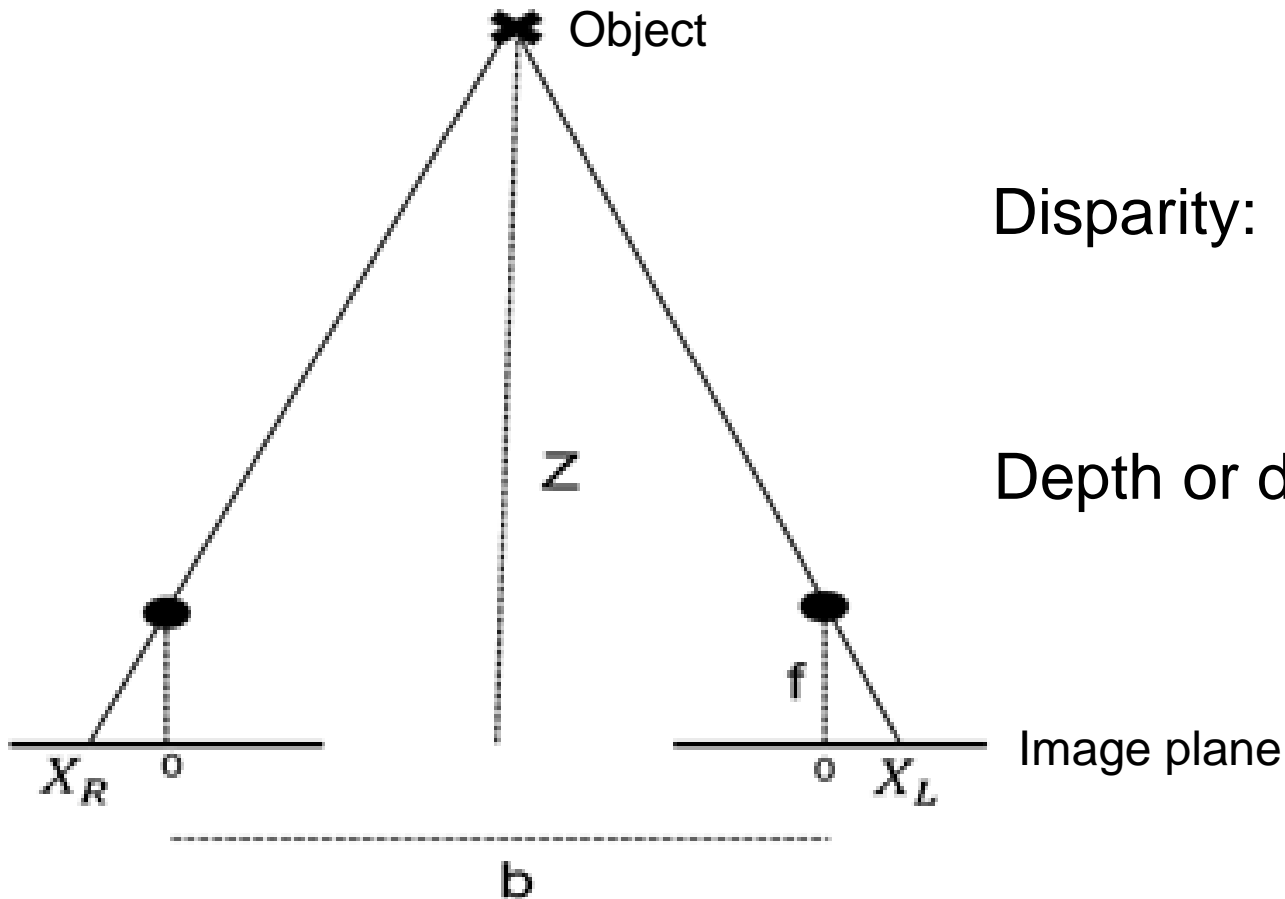


JZIAEETABAR, Fatemeh, et al. Prediction of Manipulation Action Classes Using Semantic Spatial Reasoning (*ICRA*), 2018 *IEEE International Conference on*. IEEE, 2018. Unpublished

[YILDIZ, Eren, Scene Analysis for Automated Recycling of Electromechanical Devices, Georg-August-University Göttingen, Seminar 2017

(* In Kooperation mit der Georg-August-Universität Göttingen, Gruppe: Prof. Dr. Wörgötter)

Stereo principle

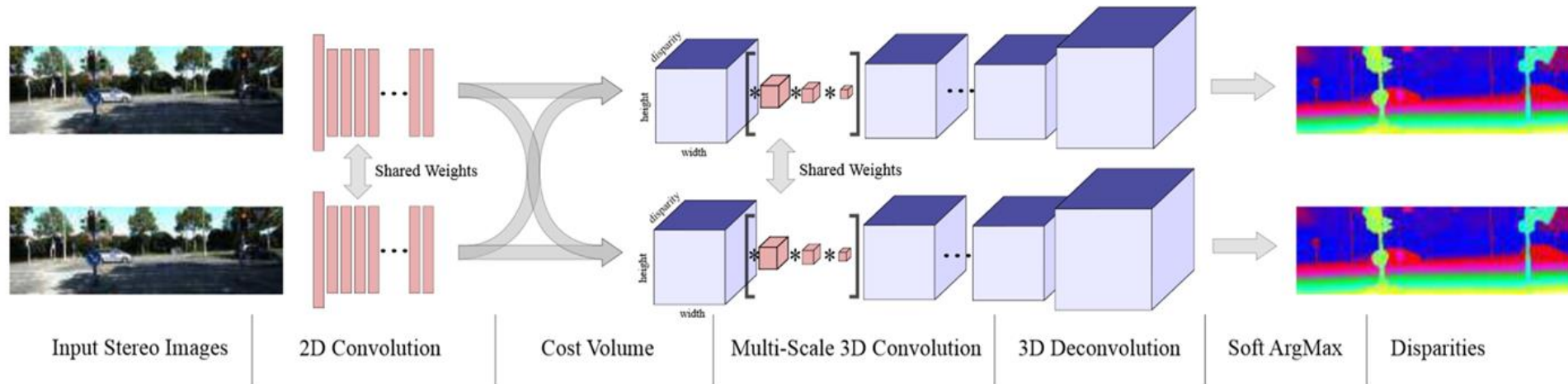
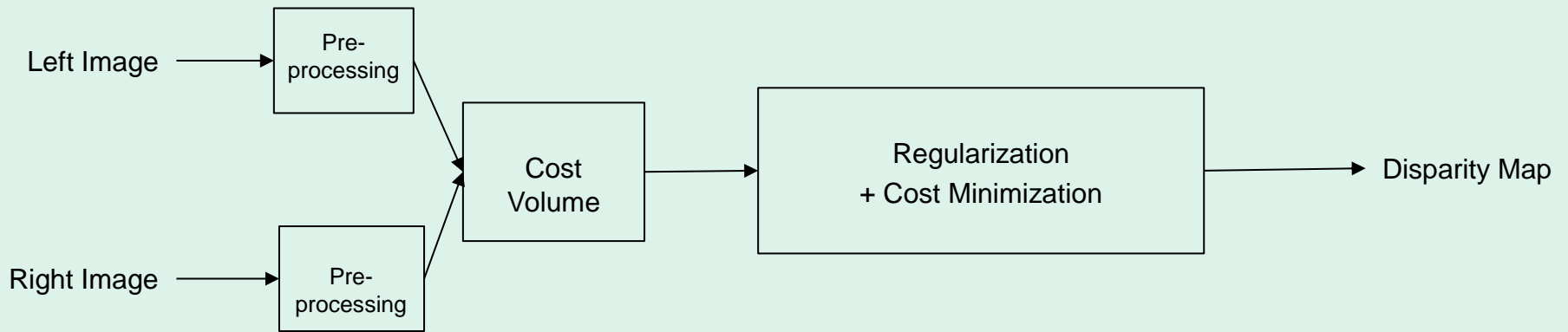


Disparity: $D = X_L - X_R$

Depth or distance to camera:

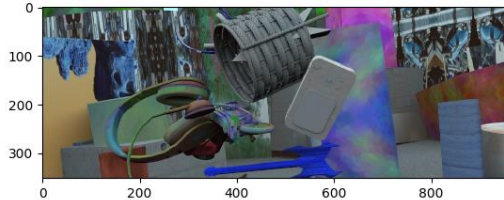
$$Z = bf/D$$

Depth from Stereo

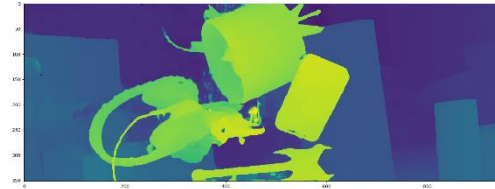


KENDALL, Alex, et al. End-to-end learning of geometry and context for deep stereo regression. *CoRR*, vol. abs/1703.04309, 2017.
 (* In Kooperation mit der Georg-August-Universität Göttingen, Gruppe: Prof. Dr. Wörgötter)

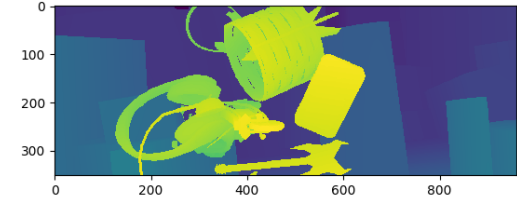
Results



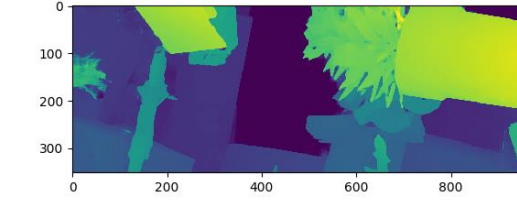
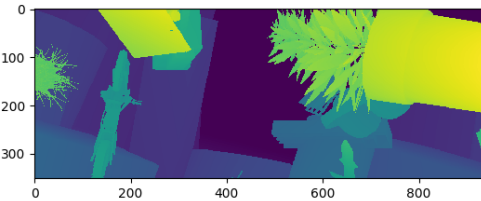
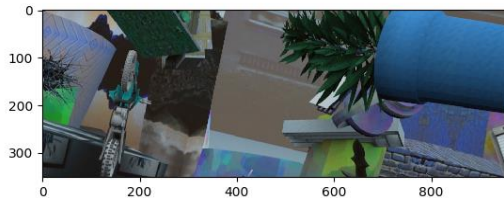
Image



Ground Truth



Result NN

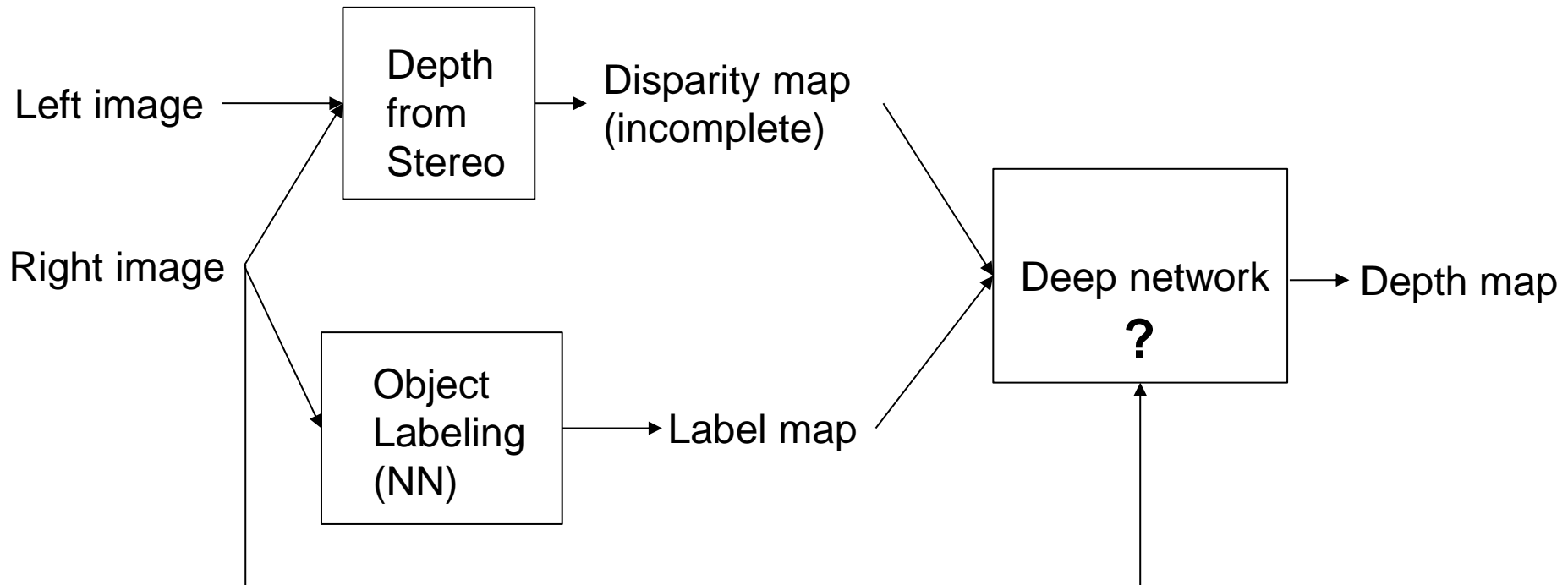


Marcell Wolnitza & Babette Dellen
Deep Stereo and Optical Flow Regression
Transylvanian Machine Learning Summer
School, 16-22 July 2018, Cluj-Napoca, Romania

However, we observed:

- Limited applicability of method beyond the training set data, but further tests are necessary

Future work



Thank you for your attention!