Computer Vision for Intelligent Robotics Presentations Paper List

Low-level Vision

[1] Matthew D Zeiler, Rob Fergus,
"**Visualizing and Understanding Convolutional Networks**",
European Conference on Computer Vision (ECCV), 2014
Paper: https://arxiv.org/pdf/1311.2901.pdf

[2] G. E. Hinton, A. Krizhevsky & S. D. Wang
"**Transforming Auto-encoders**"
Artificial Neural Networks and Machine Learning – ICANN 2011
Paper: http://www.cs.toronto.edu/~fritz/absps/transauto6.pdf

[3] Michael Bleyer, Christoph Rhemann, Carsten Rother
"**PatchMatch Stereo - Stereo Matching with Slanted Support Windows**"
Proceedings of the British Machine Vision Conference, 2011
Paper: http://www.bmva.org/bmvc/2011/proceedings/paper14/paper14.pdf

[4] Sean Ryan Fanello, Christoph Rhemann, Vladimir Tankovich, Adarsh Kowdle, Sergio Orts Escolano, David Kim, Shahram Izadi,
"**HyperDepth: Learning Depth from Structured Light Without Matching**".
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2016, pp. 5441-5450
Paper:http://www.cv-foundation.org/openaccess/content_cvpr_2016/papers/Fanello_HyperDepth_Learning_Depth_CVPR_2016_paper.pdf
https://www.youtube.com/watch?v=KJ6_quEHN_0

[5] Sudeep Pillai, Srikumar Ramalingam and John J. Leonard,
"**High-Performance and Tunable Stereo Reconstruction**".
International Conference on Robotics and Automation (ICRA), 2016
Paper:http://people.csail.mit.edu/spillai/projects/fast-stereo-reconstruction/pillai_stereo16.pdf
https://www.youtube.com/watch?v=r4bk3FmhYDk

[6] Linchao Bao, Qingxiong Yang, Hailin Jin,
"**Fast Edge-Preserving PatchMatch for Large Displacement Optical Flow**".

IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2014, Pages 3534-3541
Paper:http://www.cv-foundation.org/openaccess/content_cvpr_2014/papers/Bao_Fast_Edge-Preserving_PatchMatch_2014_CVPR_paper.pdf

[7] Aravindh Mahendran and Andrea Vedaldi,
"**Understanding Deep Image Representations by Inverting Them**".
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2015, pp. 5188-5196
Paper:http://www.cv-foundation.org/openaccess/content_cvpr_2015/papers/Mahendran_Understanding_Deep_Image_2015_CVPR_paper.pdf

[8] Eddy Ilg, Nikolaus Mayer, Tonmoy Saikia, Margret Keuper, Alexey Dosovitskiy, Thomas Brox,
"**FlowNet 2.0: Evolution of Optical Flow Estimation with Deep Networks**".
ArXiv preprint arXiv:1612.01925, 2016
Paper:https://arxiv.org/pdf/1612.01925.pdf
https://www.youtube.com/watch?v=JSzUdVBmQP4

[9] V. Balntas, K. Lenc, A. Vedaldi, K. Mikolajczyk
"**HPatch: A Benchmark and Evaluation of Handcrafted and Learned Local Descriptors**"
IEEE Conference on Computer Vision and Pattern Recognition, 2017
Paper: https://www.robots.ox.ac.uk/~vgg/publications/2017/Balntas17/balntas17.pdf

[10] Heiko Hirschmuller
"**Stereo Processing by Semi-Global Matching and Mutual Information**"
IEEE Transactions on Pattern Analysis and Machine Intelligence, 2008
Paper: https://core.ac.uk/download/pdf/11134866.pdf

[11] Wenjie Luo, Alexander G. Schwing, Raquel Urtasun,
"Efficient Deep Learning for Stereo Matching"
Conference on Computer Vision and Pattern Recognition (CVPR), 2016, pp. 5695-5703
Paper:
http://www.cv-foundation.org/openaccess/content_cvpr_2016/papers/Luo_Efficient_Deep_Learning_CVPR_2016_paper.pdf

Vision Based Ego-Motion Estimation and 3D Reconstruction

[12] Dominik Schlegel, Mirco Colosi, Giorgio Grisetti
"**ProSLAM: Graph SLAM from a Programmer's Perspective**"
In arXiv preprint arXiv:1709.04377

Paper: https://arxiv.org/pdf/1709.04377.pdf

[13] Thomas Whelan, Stefan Leutenegger, Renato F Salas-Moreno, Ben Glocker, Andrew J Davison,
"**ElasticFusion: Dense SLAM Without A Pose Graph**".
Robotics: science and systems Vol. 11 (2015)
Paper:https://www.doc.ic.ac.uk/~bglocker/pdfs/whelan2015rss.pdf
https://www.youtube.com/watch?v=XySrhZpODYs

[14] Sungjoon Choi, Qian-Yi Zhou, Vladlen Koltun,
"**Robust reconstruction of indoor scenes**".
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2015, pages 5556-5565
Paper:http://www.cv-foundation.org/openaccess/content_cvpr_2015/papers/Choi_Robust_Reconstruction_of_2015_CVPR_paper.pdf
https://www.youtube.com/watch?v=9dLUa-ekgtc

[15] Raúl Mur-Artal and Juan D. Tardós,
"**ORB-SLAM2: an Open-Source SLAM System for Monocular, Stereo and RGB-D Cameras**".
ArXiv preprint arXiv 1610.06475, 2016.
Paper:https://arxiv.org/pdf/1610.06475.pdf
https://www.youtube.com/watch?v=ufvPS5wJAx0

[16] Christian Forster, Zichao Zhang, Michael Gassner, Manuel Werlberger, Davide Scaramuzza, **"SVO: Semi-Direct Visual Odometry for Monocular and Multi-Camera Systems"**
IEEE Transactions on Robotics, 2016
Paper: http://www.zora.uzh.ch/127902/1/TRO16_Forster-SVO.pdf

[17] Jakob Engel, Vladlen Koltun, Daniel Cremers
"**Direct Sparse Odometry**"
arXiv:1607.02565 (2016)
Paper:http://vision.in.tum.de/_media/spezial/bib/engel2016dso.pdf
https://www.youtube.com/watch?v=C6-xwSOOdqQ

[18] H. Rebecq, T. Horstschaefer, G. Gallego, D. Scaramuzza,
"**EVO: A Geometric Approach to Event-based 6-DOF Parallel Tracking and Mapping in Real-time**".
IEEE Robotics and Automation Letters (RA-L), Vol. 2, Issue 2, pp. 593-600, Apr. 2017.
Paper:http://rpg.ifi.uzh.ch/docs/RAL16_EVO.pdf
https://www.youtube.com/watch?v=bYqD2qZJlxE&feature=youtu.be

[19] Mariano Jaimez, Christian Kerl, Javier Gonzalez-Jimenez, and Daniel Cremers
"**Fast Odometry and Scene Flow from RGB-D Cameras based on Geometric Clustering**"
IEEE Int. Conf. on Robotics and Automation (ICRA), 2017
Paper: http://mapir.isa.uma.es/mjaimez/Papers/Jaimez_et_al_VOSF_2017.pdf

Visual Servoing

[20] Tanner Schmidt, Katharina Hertkorn, Richard Newcombe, Zoltan Marton, Michael Suppa, Dieter Fox,
"**Depth-Based Tracking with Physical Constraints for Robot Manipulation**".
IEEE International Conference on Robotics and Automation (ICRA), 2015
Paper:https://rse-lab.cs.washington.edu/papers/DepthBasedTracking-icra-2015.pdf
https://www.youtube.com/watch?v=cUdKxgFgG00

[21] Edward Johns, Stefan Leutenegger and Andrew J. Davison,
"**Deep Learning a Grasp Function for Grasping under Gripper Pose Uncertainty**".
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2016)
Paper:https://www.doc.ic.ac.uk/~ejohns/Documents/ejohns-grasp-function-iros2016.pdf
https://www.youtube.com/watch?v=y5kRP-ERp1s

[22] A. Giusti et al.,
"**A Machine Learning Approach to Visual Perception of Forest Trails for Mobile Robots**",
IEEE Robotics and Automation Letters (RA-L), pages 661 - 667, 2016
Paper:http://rpg.ifi.uzh.ch/docs/RAL16_Giusti.pdf
https://www.youtube.com/watch?v=umRdt3zGgpU

[23] D. Falanga, E. Mueggler, M. Faessler, D. Scaramuzza,
"**Aggressive Quadrotor Flight through Narrow Gaps with Onboard Sensing and Computing using Active Vision**".
IEEE International Conference on Robotics and Automation (ICRA), 2017.
Paper:http://rpg.ifi.uzh.ch/docs/ICRA17_Falanga.pdf
https://www.youtube.com/watch?v=meSItatXQ7M

[24] Lerrel Pinto and Abhinav Gupta,
"**Supersizing Self-supervision: Learning to Grasp from 50K Tries and 700 Robot Hours**".
IEEE International Conference on Robotics and Automation (ICRA), 2017.
Paper:https://arxiv.org/pdf/1509.06825.pdf
https://www.youtube.com/watch?v=oSqHc0nLkm8
(**ICRA Best Student Conference Paper Award**)

[25] Matthew Sheckells, Gowtham Garimella and Marin Kobilarov

"**Optimal Visual Servoing for differentially flat underactuated systems**"
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2016
Paper: http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=7759815
(you should be connected to the DIAG network to download this paper, in case contact me, AP)

[26] Justin Thomas, Giuseppe Loianno, Koushil Sreenath, and Vijay Kumar
"**Toward Image Based Visual Servoing for Aerial Grasping and Perching**",
IEEE International Conference on Robotics and Automation (ICRA), 2014
Paper: https://www.cmu.edu/me/hdr/Publications/ICRA2014.pdf

Semantic Scene Segmentation

[27] Noh, Hyeonwoo and Hong, Seunghoon and Han, Bohyung
"**Learning Deconvolution Network for Semantic Segmentation**",
In: arXiv preprint arXiv:1505.04366}
Paper: https://arxiv.org/pdf/1505.04366.pdf

[28] P. Lottes, R. Khanna, J. Pfeifer, R. Siegwart, and C. Stachniss,
"**UAV-Based Crop and Weed Classification for Smart Farming**,"
in Proceedings of the IEEE Int. Conf. on Robotics & Automation (ICRA) , 2017.
Paper: http://www.ipb.uni-bonn.de/wp-content/papercite-data/pdf/lottes17icra.pdf
(**ICRA Best Paper Award in Automation 2017**)

[29] Vijay Badrinarayanan, Alex Kendall, Roberto Cipolla,
"**Segnet: A deep convolutional encoder-decoder architecture for image segmentation**".
arXiv:1511.00561, 2015
Paper:https://arxiv.org/pdf/1511.00561.pdf
https://www.youtube.com/watch?v=CxanE_W46ts

Object Detection, Classification and Localization

[30] P. Felzenszwalb, D. McAllester and D. Ramanan,
"**A discriminatively trained, multiscale, deformable part model**,"
IEEE Conference on Computer Vision and Pattern Recognition, 2008
Paper: http://people.cs.uchicago.edu/~pff/papers/latent.pdf

[31] Stefan Hinterstoisser, Cedric Cagniart, Student Members, Slobodan Ilic, Peter Sturm,
Nassir Navab, Pascal Fua, and Vincent Lepetit

“Gradient Response Maps for Real-Time Detection of Texture-Less Objects”
IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2011
Paper: http://far.in.tum.de/pub/hinterstoisser2011pami/hinterstoisser2011pami.pdf

[32] Rico Jonschkowski, Clemens Eppner, Sebastian Höfer, Roberto Martín-Martín, Oliver Brock,
“**Probabilistic Multi-Class Segmentation for the Amazon Picking Challenge**”.
IEEE/RSJ International Conference on Intelligent Robots and Systems, 2016
Paper:http://www.robotics.tu-berlin.de/fileadmin/fg170/Publikationen_pdf/Jonschkowski-16-Technical-Report.pdf
https://www.youtube.com/watch?v=Ry6JzeW0HOM

[33] M. Ulrich, C. Wiedemann and C. Steger,
"Combining Scale-Space and Similarity-Based Aspect Graphs for Fast 3D Object Recognition"
IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. 34, no. 10, pp. 1902-1914, Oct. 2012.
Paper: http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6112769
(you should be connected to the DIAG network to download this paper, in case contact me, AP)

[34] Joseph Redmon, Santosh Divvala, Ross Girshick, Ali Farhadi
"You Only Look Once: Unified, Real-Time Object Detection"
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2016, pp. 779-788
Paper:https://pjreddie.com/media/files/papers/yolo_1.pdf
https://www.youtube.com/watch?v=VOC3huqHrss

[35] Kaiming He, Georgia Gkioxari, Piotr Dollár, Ross Girshick,
“Mask R-CNN”
IEEE International Conference on Computer Vision (ICCV), 2017
(**ICCV 2017 Best Paper award**)
Paper: https://arxiv.org/pdf/1703.06870.pdf
Video: https://www.youtube.com/watch?v=g7z4mkfRjI4

[36] Max Schwarz, Anton Milan, Christian Lenz, Aura Mu ̃noz, Arul Selvam Periyasamy, Michael Schreiber, Sebastian Sch ̈uller, and Sven Behnke,
"NimbRo Picking: Versatile Part Handling for Warehouse Automation"
IEEE International Conference on Robotics and Automation (ICRA), 2017
Paper:http://www.ais.uni-bonn.de/papers/ICRA_2017_Schwarz.pdf
https://www.youtube.com/watch?v=NqAe-zGMTjM

[37] Shaoqing Ren, Kaiming He, Ross Girshick, Jian Sun
“**Faster R-CNN: Towards Real-Time Object Detection with Region Proposal Networks**”
Neural Information Processing Systems (NIPS), 2015

Paper: https://arxiv.org/pdf/1506.01497.pdf

[38] Eric Brachmann, Frank Michel, Alexander Krull, Michael Ying Yang, Stefan Gumhold, Carsten Rother,
"**Uncertainty-Driven 6D Pose Estimation of Objects and Scenes from a Single RGB Image**"
IEEE Conference on Computer Vision and Pattern Recognition (CVPR),2016
Paper: http://wwwpub.zih.tu-dresden.de/~cvweb/publications/papers/2016/rgbpose.pdf
Video: https://www.youtube.com/watch?v=CDEViOqclm0

[39] Paul Wohlhart and Vincent Lepetit
"**Learning Descriptors for Object Recognition and 3D Pose Estimation**"
IEEE Conference on Computer Vision and Pattern Recognition (CVPR),2015
Paper:
https://www.cv-foundation.org/openaccess/content_cvpr_2015/papers/Wohlhart_Learning_Descriptors_for_2015_CVPR_paper.pdf

[40] Fabio Maria Carlucci, Paolo Russo, Barbara Caputo
"**A deep representation for depth images from synthetic data**"
IEEE International Conference on Robotics and Automation (ICRA), 2017
Paper: https://arxiv.org/pdf/1609.09713.pdf