

Topics: Machine Learning for Human-Robot Interaction – Seminar Winter 19/20

This is not an exhaustive list and can be used as a guidance to other paper.

Vision:

Object detection, localization, recognition

Nonverbal communication: static and dynamic gesture recognition, gaze behavior and joint attention

Facial expressions

Example paper:

J. Redmon, S. Divvala, R. Girshick and A. Farhadi, "You Only Look Once: Unified, Real-Time Object Detection," 2016 IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Las Vegas, NV, 2016, pp. 779-788. (YOLO framework, code on project website)

R. Girshick, J. Donahue, T. Darrell and J. Malik, "Rich Feature Hierarchies for Accurate Object Detection and Semantic Segmentation," 2014 IEEE Conference on Computer Vision and Pattern Recognition, Columbus, OH, 2014, pp. 580-587. (R-CNN, code on github)

Kaiming He, Xiangyu Zhang, Shaoqing Ren, Jian Sun (2014). Spatial Pyramid Pooling in Deep Convolutional Networks for Visual Recognition. European Conference on Computer Vision (ECCV), pp. 346-361

Rich, C., Ponsler, B., Holroyd, A., & Sidner, C. L. (2010). Recognizing engagement in human-robot interaction. In *Human-Robot Interaction (HRI), 2010 5th ACM/IEEE International Conference on* (pp. 375–382).

Boucher, J.-D., Pattacini, U., Lelong, A., Bailly, G., Elisei, F., Fagel, S., Ventre-Dominey, J. (2012). I reach faster when I see you look: gaze effects in human–human and human–robot face-to-face cooperation. *Frontiers in Neurorobotics*, 6.

Addwiteey Chrungoo, S. S. Manimaran, Balaraman Ravindran (2014). Activity Recognition for Natural Human Robot Interaction. International Conference on Social Robotics, pp. 84-94

Pablo Barros, Sven Magg, Cornelius Weber, Stefan Wermter (2014). A Multichannel Convolutional Neural Network for Hand Posture Recognition Proceedings of the 24th International Conference on Artificial Neural Networks (ICANN 2014), pages 403--410

Eleni Tsironi, Pablo Barros, Cornelius Weber, Stefan Wermter (2017). An analysis of Convolutional Long Short-Term Memory Recurrent Neural Networks for gesture recognition, Neurocomputing, Volume 268, pp. 76-86

Kumra S., Kanan C. Robotic grasp detection using deep convolutional neural networks. 2017 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

Zeng, Nianyin & Zhang, Hong & Song, Baoye & Liu, Weibo & Li, Yurong & Abdullah, Dobaie. (2017). Facial Expression Recognition via Learning Deep Sparse Autoencoders. Neurocomputing. 10.1016/j.neucom.2017.08.043. (access paper via Research Gate)

Language/speech:

Sentence Classification, part-of-speech tagging

Chatbots

Sentiment analysis

Example paper:

J. Lilleberg, Y. Zhu and Y. Zhang, "Support vector machines and Word2vec for text classification with semantic features," 2015 IEEE 14th International Conference on Cognitive Informatics & Cognitive Computing (ICCI*CC), Beijing, 2015, pp. 136-140.

Johnson R. Zhang T. (2015) Effective Use of Word Order for Text Categorization with Convolutional Neural Networks. <https://arxiv.org/abs/1412.1058>

Emotions and intention:

Emotion recognition

Affective computing

Example paper:

Amami et al. (2015). Haptic Human-Robot Affective Interaction in a Handshaking Social Protocol. In Proc. of the Tenth Annual ACM/IEEE International Conference on Human-Robot Interaction (HRI'15), pp. 263-270.

Barros, Pablo and Weber, Cornelius and Wermter, Stefan (2016). Learning Auditory Representations for Emotion Recognition, Proceedings of International Joint Conference on Neural Networks (IJCNN/WCCI), pp. 921-928

Human-Robot interaction evaluation, humanoid and social robots, gender issues:

Breazeal, C. (2004). Social Interactions in HRI: The Robot View. *IEEE Transactions on SMC, Part C*, 34(2), 181–186.

Gockley, R., et al. (2005). Designing robots for long-term social interaction. In 2005 *IEEE/RSJ International Conference on Intelligent Robots and Systems. (IROS 2005)*. (pp. 1338–1343).

Mumm, J., & Mutlu, B. (2011). Human-robot proxemics: physical and psychological distancing in human-robot interaction. In *Proceedings of the 6th international conference on Human-robot interaction – HRI '11* (p. 331).

Sharkey, A., & Sharkey, N. (2012). Granny and the robots: ethical issues in robot care for the elderly. *Ethics and Information Technology*, 14(1), 27–40.

Siegel, M., Breazeal, C., & Norton, M. I. (2009). Persuasive Robotics: The Influence of Robot Gender on Human Behavior. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)* (pp. 2563–2568).

Malle, B. F., Scheutz, M., Arnold, T., Voiklis, J., & Cusimano, C. (2015). Sacrifice One For the Good of Many? People Apply Different Moral Norms to Human and Robot Agents. In *Proceedings of the Tenth Annual ACM/IEEE International Conference on Human-Robot Interaction* (pp. 117-124). ACM.

Other topics:

Survey of image benchmark datasets and state-of-the-art model performance

Survey of speech/language benchmarks and state-of-the-art model performance

Transfer Learning

Regression models

Reinforcement Learning

Optimization in machine learning