

# Final Report

Franziska Schwaiger  
Matriculation number: 03658670

Thomas Barthel Brunner  
Matriculation number: 03675118

## INTRODUCTION

## METHODS

*Robot Simulations*

*Dataset*

*Considering Singularities*

*Hyperparameter Optimization*

## EXPERIMENTAL EVALUATION

*Evaluation protocol*

*Results*

## CONCLUSION

## REFERENCES

- [1] L. Ardizzone, J. Kruse, S. J. Wirkert, D. Rahner, E. W. Pellegrini, R. S. Klessen, L. Maier-Hein, C. Rother, and U. Köthe, “Analyzing inverse problems with invertible neural networks,” *CoRR*, vol. abs/1808.04730, 2018. [Online]. Available: <http://arxiv.org/abs/1808.04730>
- [2] K. Sohn, H. Lee, and X. Yan, “Learning structured output representation using deep conditional generative models,” in *Advances in Neural Information Processing Systems*, C. Cortes, N. Lawrence, D. Lee, M. Sugiyama, and R. Garnett, Eds., vol. 28. Curran Associates, Inc., 2015, pp. 3483–3491.
- [3] M. Mirza and S. Osindero, “Conditional generative adversarial nets,” *CoRR*, vol. abs/1411.1784, 2014. [Online]. Available: <http://arxiv.org/abs/1411.1784>
- [4] A. Gretton, K. M. Borgwardt, M. J. Rasch, B. Schölkopf, and A. J. Smola, “A kernel method for the two-sample problem,” *CoRR*, vol. abs/0805.2368, 2008. [Online]. Available: <http://arxiv.org/abs/0805.2368>
- [5] Y. Zhou, C. Barnes, L. Jingwan, Y. Jimei, and L. Hao, “On the continuity of rotation representations in neural networks,” in *The IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2019.
- [6] J. Kruse, L. Ardizzone, C. Rother, and U. Köthe, “Benchmarking invertible architectures on inverse problems,” Tech. Rep. i, 2019.
- [7] B. Choi and C. Lawrence, “Inverse kinematics problem in robotics using neural networks,” Tech. Rep., 1992.
- [8] L. Dinh, J. Sohl-Dickstein, and S. Bengio, “Density estimation using real NVP,” *CoRR*, vol. abs/1605.08803, 2016. [Online]. Available: <http://arxiv.org/abs/1605.08803>
- [9] D. P. Kingma and M. Welling, “Auto-encoding variational bayes,” 2014.
- [10] graviraja, “pytorch-sample-codes,” <https://github.com/graviraja/pytorch-sample-codes>, 2019.
- [11] “Freia,” <https://github.com/VLL-HD/FrEIA/blob/master/FrEIA/>, 2020.