Oriol Corcoll

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Employment

University of Tartu - Researcher - Tartu, Estonia **Sept. 2020 - present**

- I study how artificial agents can make better decisions by understanding causal relations. I firmly believe there is a significant leap towards understanding intelligence at the intersection of reinforcement learning and causality. Building agents that see the world from a causal lens can enable principled drug discovery, informed interventions on gene regulatory networks, and better decision-making for clinicians. In particular, I study how RL agents can discover, learn and exploit causal relations present in the world in an unsupervised manner.

Amazon Alexa - Research engineer - London, UK **June 2017 – June 2018**

- Built a highly-scalable multimedia curation pipeline.
- Led and implemented using deep learning the semantic-image cropping system for Alexa.
- Led and implemented the aesthetic quality system for Alexa.

Amazon Video - Software engineer - London, UK **April 2015 – June 2017**

- Built a high-traffic and highly available price engine to provide discounts and offers to Amazon Video customers.

CashOnGo - Software engineer - Tallinn, Estonia **Sept. 2014 – March 2015**

- Redesigned and implemented a scalable loan engine.

Aalto University - Researcher - Helsinki, Finland **June – Sept. 2014**

- Designed a prediction engine for DNA-based tile models in the Natural Computation research lab.

MediaPro - Software engineer - Barcelona, Spain **June – Sept. 2013**

- Built a football data analysis tool for FIFA clubs like FC Barcelona or Real Madrid.

eConcept Solutions - Software engineer - Mallorca, Spain **June 2007 – Sept. 2010**

- Solutions architect.

Education

PhD Computer science - University of Tartu **Sept. 2018 – Summer 2022**

MSc Data science - Queen Mary University of London **Sept. 2016 – June 2018**

BSc Computer science - Polytechnic University of Catalonia **Sept. 2010 – June 2014**

Publications

- Explanatory World Models via Look Ahead Attention for Credit Assignment. **O. Corcoll**, R. Vicente. In progress.
- Mind the gap: Challenges of deep learning approaches to Theory of Mind. Under review. J. Aru, A. Labash, **O. Corcoll**, R. Vicente. Under review.
- Quantifying reinforcement-learning agent's autonomy, reliance on memory and internalisation of the environment. A. Ingel, A. Makkeh, **O. Corcoll**, R. Vicente. Entropy, special issue Towards a Quantitative Understanding of Agency, 2022.
- Disentangling causal effects for hierarchical reinforcement learning. **O. Corcoll**, R. Vicente (2022). Conference on Causal Learning and Reasoning (CLeaR), 2022.
- Did I do that? Blame as a means to identify controlled effects in reinforcement learning. **O. Corcoll**, Y. Mohamed, R. Vicente. URL @ International Conference on Machine Learning (ICML), 2021.
- Attention manipulation in reinforcement learning agents. **O. Corcoll**, A. Makkeh, J. Aru, D. Theis, R. Vicente. Cognitive Computational Neuroscience (CCN), 2019.

Awards and Scholarships

NVIDIA research grant **2019**

AWS research grant **2019**

Talks

- Lecture on Attention and Transformers for the Neural Networks course.
- Designed and organized the Computational Neuroscience seminar.
- Contrastive/Regularized learning at University of Tartu.
- Credit Assignment in reinforcement learning.
- Discrete representation learning.

Tech

- **Languages:** python, java, scala, c#, c++
- **Deep Learning:** reinforcement learning, unsupervised learning, pytorch, tensorflow, keras
- **Data Science:** redshift, neptune, spark, parquet, numpy, pandas, scipy, sklearn, matplotlib, jupyter
- **Infrastructure:** aws, docker, airflow, wandb, ray, hydra