

# Olaf Lipinski

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Artificial Intelligence (AI) Ph.D. candidate specializing in emergent communication, with expertise in designing and implementing novel neural network architectures. Strong publication track record in AI research, with comprehensive knowledge of both theoretical and practical aspects of machine learning. Seeking to leverage my skills developed through academia and industry to contribute to cutting-edge AI research.

## EDUCATION

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**University of Southampton** | *Ph.D. in Artificial Intelligence* **2020 – Present**  
Predicted submission: Dec 2024

- **Thesis:** Time in Emergent Communication
- Supervised by Prof. Timothy Norman, Prof. Adam Sobey, and Prof. Federico Cerutti.
- Investigated the effect of time on communication protocols, improving agents' strategy development and convergence speed.
- Designed an architecture necessary for the emergence of temporal referencing in agent communication, enabling efficient communication.
- Developed human-interpretability measures for an emergent language containing local spatio-temporal relationships.
- **Expertise:** AI, Python, PyTorch (Lightning), Ray (RLlib), FPGAs.
- **Professional Skills:** Research impact, research communication, academic collaboration.

**University of Liverpool** | *B.Sc. in Computer Science* **2016 – 2020**

- **First Class Honours**
- **Thesis:** Feasibility of Quantum Computers with Regards to Defeating Cryptographic Hashes
- **Expertise:** Java, SQL, Assembly, C, and PROLOG.
- **Professional Skills:** Module on IT professionalism and industry standards.

## EXPERIENCE

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**Intel Corporation** **Jul 2018 – Aug 2019**  
**HPC Technical Engineer Intern** Swindon, UK

- Managed client-facing HPC and Cloud facilities in a three-member team, ensuring seamless operations and optimal performance.
- Facilitated client onboarding to test labs, providing support and guidance.
- Collaborated with interdisciplinary teams on pre-production hardware projects, addressing complex technical challenges.
- Worked with international teams to deliver the best client experiences.
- **Expertise:** HPC, Cloud, Bash, Linux, Hardware.
- **Achievements:** Multiple awards for outstanding customer focus and service excellence.

**VLDB Solutions** **Jun 2017 – Apr 2018**  
**Technical Consultant** Liverpool, UK

- Developed efficient Bash and SQL scripts for customer data analysis.
- Gained foundational knowledge in Big Data and AWS services.
- Progressed from intern to part-time role, contributing to multiple projects.
- **Expertise:** Amazon AWS (EC2, S3, Redshift), SQL, Bash.

## PUBLICATIONS

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1. **Olaf Lipinski**, Adam J. Sobey, Federico Cerutti, and Timothy J. Norman. Speaking Your Language: Spatial Relationships in Interpretable Emergent Communication. In *Neural Information Processing Systems (NeurIPS)*, 2024
2. **Olaf Lipinski**, Adam J. Sobey, Federico Cerutti, and Timothy J. Norman. It's About Time: Temporal References in Emergent Communication, October 2023. arXiv:2310.06555 (Under review)
3. **Olaf Lipinski**, Adam J. Sobey, Federico Cerutti, and Timothy J. Norman. Emergent Password Signalling in the Game of Werewolf. In *Emergent Communication Workshop at ICLR 2022*, April 2022

## CONFERENCES AND TALKS

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**Emergent Communication Workshop** The Alan Turing Institute London, UK | Oct 24, 2023  
**Boldrewood Lunchtime Seminar 84** Boldrewood Campus Southampton, UK | Feb 28, 2022

## PUBLIC ENGAGEMENT

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**Could we ever decipher an alien language?** The Conversation UK Virtual, UK | Nov 7, 2024  
**Career in Science Interview** Coopernicus Virtual, Poland | Jun 29, 2024  
**Science and Engineering Day** University of Southampton Southampton, UK | May 07, 2022

## OPEN - SOURCE CONTRIBUTIONS

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- Contributed to high-impact open-source projects such as TensorFlow, Ray, RLLib, and OpenAI Gym/Farama Gymnasium.
- Developed and maintained a Python package, emlangkit, which provides essential tools for analysing the emergent language of agents. The package features a full automation pipeline, continuous integration/continuous deployment (CI/CD) testing, and automated releases to PyPI.

## SKILLS

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**Programming** Python | Bash | Git | GitHub | PyCharm | Jupyter Notebook

**Artificial Intelligence** PyTorch | RLLib | Pandas | NumPy | Scikit-learn | Data Visualization | Reinforcement Learning | Multiagent Systems | Machine Learning | RNNs

**Cloud & HPC** Enterprise Linux | HPC | SLURM | Docker | Automation (Salt)

**Languages** English (Native/C2) | Polish (Native/C2) | Portuguese (Basic/A2)

## INTERESTS

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### Homelabbing

- Managed an extensive personal homelab over several years, using self-hosted infrastructure behind a Vyos router.
- Expanded and maintained knowledge of cloud software such as Nextcloud.
- Set up a private GitLab server, integrated with node monitoring using node-exporter, InfluxDB, and Grafana.
- Utilized Salt and MAAS for configuration management and hardware provisioning.
- Established an Internet of Things (IoT) endpoint for tracking environmental variables.
- Currently investigating migration to Kubernetes.

### Other Interests

Reading science fiction, Sourdough Baking, Developing own PCBs