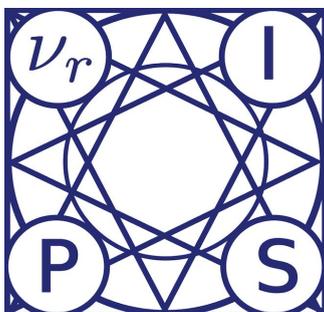


PRESS INFORMATION

1st December 2018

InstaDeep Presents Two AI Research Papers at NeurIPS 2018



InstaDeep, one of the fastest growing AI start-ups, is proud to announce that two AI papers produced by its researchers have been accepted for presentation at the Neural Information Processing Systems (NeurIPS) Conference this year. It is the first time the company presents at the world's leading annual AI conference.

The conference, renowned as the most prestigious machine-learning meeting globally, is held for the 32nd time, this year in Montreal, Canada. While it received a record number of 4,854 research papers for submission, the acceptance rate stayed the same at a mere 21%¹.

"It is an honour and a milestone for InstaDeep to have two papers accepted at this year's NeurIPS," says Karim Beguir, CEO of InstaDeep. "It is evidence of our ground-breaking research and development breakthroughs and demonstrates the expertise and knowledge our team harnesses."

In addition to the research papers, Beguir is a keynote speaker at NeurIPS's workshop Black In AI, a workshop focusing on life on the inside of Pan-African AI Machine Learning start-ups. He will speak about what it's like working with AI and ML in Africa, and InstaDeep's initiatives on the African continent. In addition, two InstaDeep colleagues will also present posters during the poster presentation session at Black In AI, with one of the posters also featuring in the workshop Machine Learning for Development.

¹ <https://medium.com/syncedreview/neurips-2018-opens-best-papers-announced-a6b66508c150>

Here is the research InstaDeep will present at NeurIPS2018:

Research Papers

[Ranked Reward: Enabling Self-Play Reinforcement Learning for Combinatorial Optimization](#)

Authors: Alexandre Laterre, Yunguan Fu, Mohamed Khalil Jabri, Alain-Sam Cohen, David Kas, Karl Hajjar, Hui Chen, Torbjørn S. Dahl, Amine Kerkeni, Karim Beguir

Abstract: Adversarial self-play in two-player games has delivered impressive results when used with reinforcement learning algorithms that combine deep neural networks and tree search. Algorithms like AlphaZero and Expert Iteration learn tabula-rasa, producing highly informative training data on the fly. However, the self-play training strategy is not directly applicable to single-player games. Recently, several practically important combinatorial optimisation problems, such as the travelling salesman problem and the bin packing problem, have been reformulated as reinforcement learning problems, increasing the importance of enabling the benefits of self-play beyond two-player games. We present the Ranked Reward (R2) algorithm which accomplishes this by ranking the rewards obtained by a single agent over multiple games to create a relative performance metric. Results from applying the R2 algorithm to instances of a two-dimensional and three-dimensional bin packing problems show that it outperforms the generic Monte Carlo tree search, heuristic algorithms and integer programming solvers. We also present an analysis of the ranked reward mechanism, in particular, the effects of problem instances with varying difficulty and different ranking thresholds. Read the research paper in full [here](#).

[Explicit Sequence Proximity Models for Hidden State Identification](#)

Authors: Anil Kota, Sharath Chandra and Parag Khanna (all Visvesvaraya National Institute of Technology, India) and Torbjørn S. Dahl (InstaDeep Ltd./University of Plymouth, UK)

Abstract: Sequence similarity is a critical concept for comparing short- and long-term memory in order to identify hidden states in partially observable Markov decision processes. While connectionist algorithms can learn a range of ad hoc proximity functions, they do not reveal insights and generic principles that could improve overall algorithm efficiency. Our work uses the instance-based Nearest Sequence Memory (NSM) [5] algorithm as a basis for exploring different explicit sequence proximity models including the original NSM proximity model and two new models, temporally discounted proximity and Laplacian proximity. The models were compared using three benchmark problems, two discrete grid world problems

and one continuous space navigation problem. The results show that more forgiving proximity models perform better than stricter models and that the difference between the models is more pronounced in the continuous navigation problem than in the discrete grid world problems. Read the research paper in full [here](#).

Poster Presentations

CHOWNET: An Image Dataset for Local African Food

Authors: Tejumade Afonja, Oluwafemi Azeez, George Igwegbe

People from different cultural background eat different food and studies has shown that people feel connected to their food choices as a form of identity. In our effort to contribute to the data collection process in Africa, we want to build a large scale image dataset for local African food, and we seek to collect 200-500 image dataset for different local African foods across the continent starting with Nigeria.

Using Community Initiatives as a tool to promote diversity and inclusions in AI

Authors: Muthoni Wanyoike, Kathleen Siminyu, Deepali Gohil

Nairobi Women in Machine Learning and Data Science (NWiMLDS) is a community for women who work in and has an interest in, Machine Learning and Data Science. The community exists to offer learning, networking, and career advancement opportunities for women in the sector in Kenya. In this paper, the researchers are looking at different community initiatives that can help resolve specifically identified problems women in AI face in the country, such as lack of adequate research funds and infrastructure, lack of researcher confidence, and inadequate skills, among others. See the poster in full [here](#).

- END -

For more information contact communications@instadeep.com or call +44(0)20 3890 7528.

ABOUT INSTADEEP

Founded in Tunis in 2015 by Karim Beguir and Zohra Slim, InstaDeep is today one of the fastest growing AI start-ups delivering AI products and solutions for the enterprise, with headquarters in London, and offices in Paris, Tunis, Nairobi and Lagos.

INTERNATIONAL PRESS RELEASE

Powered by high-performance computing and outstanding research and development breakthroughs, InstaDeep utilises deep reinforcement learning to create AI systems that can optimise decision-making processes in real-life industrial environments. Our skilled in-house team of AI researchers, Machine Learning engineers, Hardware and Visualization experts, harness the expertise to build end-to-end products that can tackle the most challenging optimisation and automation challenges, and provide real value and ROI to your business. InstaDeep offers a host of AI solutions, ranging from optimised pattern-recognition, GPU-accelerated insights, to self-learning decision making systems.

InstaDeep partners with organisations such as Deep Learning Indaba, Google Launchpad Accelerator, Facebook Dev Circles and Data Science Nigeria to support the rise of AI in Africa and across the globe.

InstaDeep was named as one of the 20 global tech start-up companies to watch in 2017 by PCMag², and Karim is one of only 30 ML/AI Experts worldwide to be certified by Google (Nov 2017).

www.instadeep.com

² <https://www.pcmag.com/feature/352129/mwc-2017-20-intriguing-global-startups-to-watch>