

# Lifelike Computing Systems Workshop (LIFELIKE 2022)

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Technological systems have been a part of the human way of life since prehistory. While initially taking the form of passive tools, such as axes and spoons, the industrial revolution saw the advent of powered, mechanised technology, operating “under their own steam” without direct human control over every action. By integrating more complex information processing machinery, automation evolved into autonomy, as decision-making and self-regulation became features of modern technology. Now, so-called “intelligent systems”, embodying techniques from the field of Artificial Intelligence (AI), are designed with the explicit intention of replicating rational behaviours and the sorts of things that minds do inside technological systems.

At the same time, the study of artificial life has explored the properties of living systems, both as they are found in nature, as they might be, and as humans can build them. This has exposed a large variety of mechanisms that produce *qualities* typically associated with life. Examples include self-organisation, homeostasis, self-replication, evolution, learning, self-awareness, and many others besides. The aim of the Lifelike Computing Systems workshop is to learn from the study of life and living systems in order to develop new, useful, ‘lifelike’ systems; a further aim is to identify when such features are of value. The workshop’s focus is primarily on engineered technological systems broadly within the domain of computing.



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This new agenda builds on a long and highly successful tradition in biologically-inspired computing, yet not only seeking inspiration in the living world but also seeking to replicate its qualities explicitly. The agenda also goes beyond pure ALife research since it has a focus explicitly on building useful, valuable, technological systems for humans based on ALife principles. The *Lifelike Computing Systems* Workshop evolved from the workshop Series on Autonomously Learning and Optimising Systems (SAOS), which grew from the Organic Computing initiative and ran for seven consecutive years at the International Conference on Architecture of Computing Systems (ARCS).

## **LIFELIKE 2022**

The third edition of the Lifelike Computing Systems workshop (LIFELIKE 2022) was once more held in conjunction with the International Conference on Artificial Life, which, due to the ongoing pandemic situation in the year 2022, again took place as a virtual event (ALife 2022).

Following a thorough peer review process with usually three independent expert reviews per paper, five submissions were accepted for presentation at the workshop and publication in the workshop proceedings volume. Also, one extended abstract paper accompanying an invited talk by Juniper Lovato (Vermont Complex Systems Center, University of Vermont, Canada) entitled “Lifelikeness is in the eye of the beholder: demographics of deepfake detection and their impacts on online social networks” underwent a peer-review process.

As is the tradition in our series, the workshop was opened with a keynote talk by a renowned researcher in the field – this year by Lukas Esterle (Aarhus University, Denmark), who reported on his research on collaborative systems that learn and work together. The then-presented contributions covered diverse topics ranging from a report of a student project to build a robotic dog capable of expressing emotions, over artificial DNA enabling embedded systems to self-organise and self-configure, to evolutionary machine learning and neuromodulation approaches for identifying and overcoming disturbances and changes as well as recommending actions in learning systems.

The LIFELIKE organisers would like to thank all authors for submitting their recent work, our invited speaker Lukas Esterle for his inspiring keynote, the programme committee members for their thorough and detailed reviews, the presenters for their exciting talks, and the numerous attendees for the great discussions during the workshop. We are looking forward to welcoming you all again in one of the upcoming LIFELIKE editions.

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