

## **Spiking Neural Networks**

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Spiking Neural Networks (SNN) are a rapidly emerging means of neural information processing, drawing inspiration from brain processes. They have the potential to advance technologies and techniques in fields as diverse as medicine, finance, computing and indeed any field that involves complex temporal or spatio-temporal data. SNN, as the third generation of neural networks, can operate on noisy data, in changing environments at low power and with high effectiveness. Due to their basis in biological neural networks, SNN research is strongly positioned to benefit from advances made in the fields of molecular, evolutionary and cognitive neuroscience.

There is presently considerable interest in this topic. We believe that this area is quickly establishing itself as an effective alternative to traditional machine learning technologies and that interest in this area of research is growing rapidly.

This special session aims to bring together researchers from contemporary areas of SNN, including theoretical, computational, application-oriented, experimental studies and emerging technologies such as neuromorphic hardware.

### **Topics relevant to this special session include, but are not limited to**

- Theory of SNN
- Learning algorithms for SNN, including Deep Learning
- Computation with and within SNN
- Theory or practice in biologically realistic neural simulation or biomimetic models
- Big data and stream data processing in SNN
- Multiple sensor networks data processing in SNN
- Neuromorphic hardware systems and applications
- Optimization of SNN
- SNN models of cognitive development
- Information coding for SNN
- SNN applications in neuroinformatics, bioinformatics, medicine and ecology.
- SNN in BCI
- SNN in neuro-robotic
- Any other topics relating to Spiking Neural Networks, their theory, or applications.

Thus, the special session reports state-of-the-art approaches, recent advances and the potential of SNN.