Idaho State University
Mathematics and Statistics

Undergraduate Colloquium

Quantum machine learning and pattern recognition based on spin-network evaluations

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Spin-networks are graphs with edges colored by irreducible representations of a compact Lie group and vertices labeled by intertwiners. They play a fundamental role in quantum topology (Turaev-Viro invariants of 3-manifolds), as well as in quantum gravity (Ponzano-Regge model). They have more recently found qpplication in quantum machine learning. The systematic evaluation of spin-networks, however, is still computationally demanding, and it is very difficult in practice to perform computations due to the factorial nature of the computational complexity.

In this talk, I will present an efficient approach for the evaluation of spin-networks, and I will show how this procedure has applications in pattern recognition even without the need of training a neural network. This talk is based on ongoing work with Matteo Lulli (STUSTech) and Antonino Marciano (Fudan University and National Institute of Nuclear Physics, Italy), and fits in a larger quantum machine learning program with several additional co-authors: Farbocini (Tongji), Fields (Tufts), Greco (Trieste) and Gresnigt (Liverpool-Xi'an Jiatong).

Tuesday, Sept. 12
4:00 pm
PS 308

Zoom Meeting ID: 83918530990