



**Idaho State
University**

Mathematics
and Statistics

Colloquium

Adaptive gradient methods with momentum for optimization

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Gradient methods are widely used in optimization problems. However, optimal parameter selection for these methods typically relies on the smoothness and strong convexity parameters of the objective. In practice, while the smoothness parameter can be estimated with techniques such as backtracking, estimating the strong convexity parameter remains a challenge. In this talk, we will show a framework for dynamically adapting the step size and momentum parameters in accelerated first-order gradient methods for quadratic optimization problems, without prior knowledge of the strong convexity parameter. The main idea is to use the ratio of residual norms at two consecutive iterations as an empirical estimate of the upper bound on the convergence rate. We will illustrate the performance of the proposed adaptive algorithms on both quadratic and nonlinear problems.

Wednesday, Dec. 3

4:00 pm

PS 308

Zoom ID: 84197528125