

# Physics-Informed Neural Networks for Power Systems Applications

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A power system consists of several critical components necessary for providing electricity to the consumers from the producers. Monitoring the lifetime of power system components becomes vital since they are subjected to electrical currents and high temperatures, which affect their aging. As the data is limited and complex in the field of components' aging, Physics-Informed Neural Networks (PINNs) can help overcome the problem. PINNs exploit the prior knowledge stored in partial differential equations (PDEs) or ordinary differential equations (ODEs), modeling the involved systems. This prior knowledge becomes a regularization agent, constraining the space of available solutions and consequently reducing the training data needed. This talk presents how we design and implement PINNs for monitoring the aging of power system components by highlighting the method's advantages and limitations in the field.