

The rise of machine learning, particularly through the use of neural networks, has begun to change how we solve problems, including understanding simple physical systems. This thesis focuses on the Direct Poisson Neural Network (DPNN), a network that uses the structure of Hamilton's equations of motion to learn from data. This method allows us to extract the Hamiltonian and Poisson bivector from the data, helping to identify the type of physical systems. We explore how DPNN works with noisy data and when data is limited, checking its ability to make predictions in challenging conditions. Moreover, we have implemented Energy Ehrenfest regularisation to the model, which helps it recognise and simulate dissipative systems better.