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Discovering Rules with Convolutional Neural Networks

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This paper uses convolutional neural networks to try to discover the rules of a few exemplary processes. As the test cases, we consider John Conway's Game of Life and plane wave propagation in a vacuum. Both processes can be represented as a convolution of a 3-by-3 mask with an image. In the case of Game of Life, the image is a binary image representing dead/alive cells. For the wave propagation example, the image is a grayscale image. The brightness represents the intensity of an electric field in a perpendicular direction to the plane of the image. It seems that both of the processes can be rediscovered using a simple convolutional neural network.

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