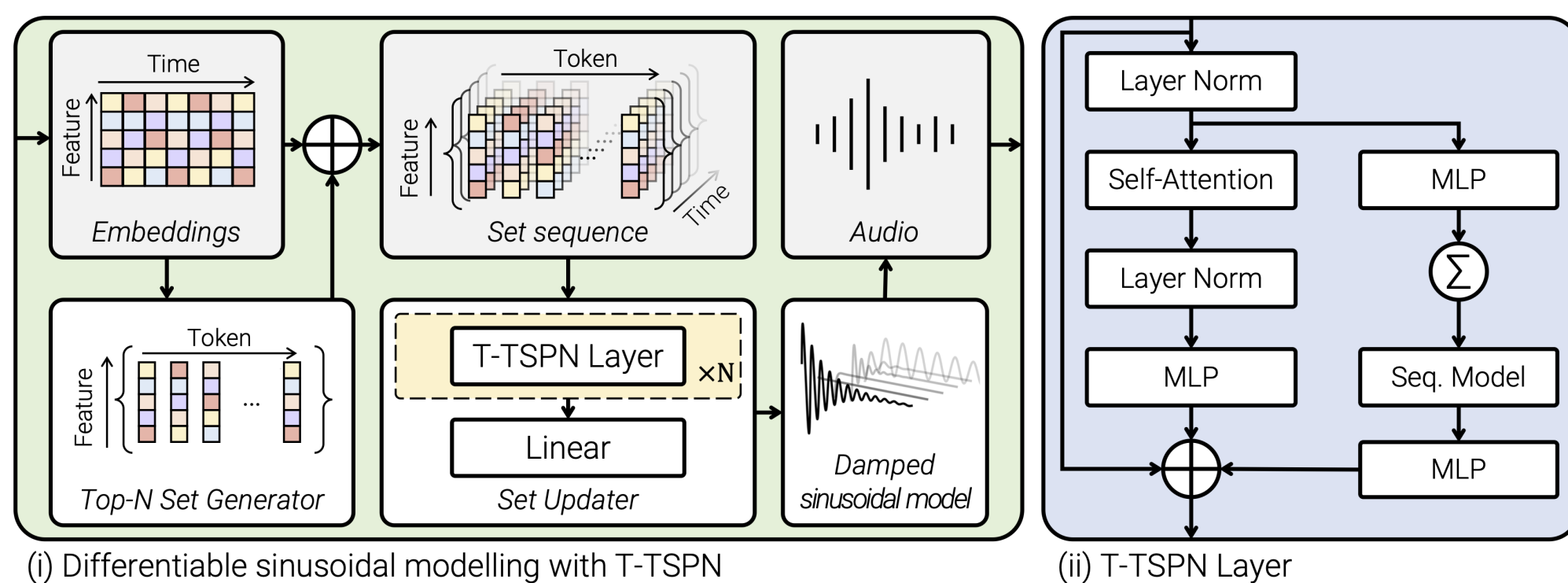


# Permutations, periodicity, and symmetry: resolving optimisation pathologies in differentiable signal processing

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## Finding

There exists a simple surrogate model that allows direct optimization of sinusoidal parameters.

## Question

Many signal processors are invariant under the actions of some finite group on their parameters. To what extent do these symmetries hinder the learning of neural network controllers for synthesizers and audio processors? And what strategies can be used to resolve this?