# Notes on Modeling Long Sequences with Structured State Spaces

Compiled by D. Gueorguiev 3/26/2024

## Introductory Notes

A central goal of sequence modeling is designing a single principled model that can address sequence data across a range of modalities and tasks, particularly on long-range dependencies.

## Literature

[Efficiently Modeling Long Sequences with Structured State Spaces, K. Goel, A. Gu et al, 2022](https://github.com/dimitarpg13/transformers_intro/blob/main/articles_and_books/state_space_models/Efficiently_Modeling_Long_Sequences_with_Structured_State_Spaces_Gu_Stanford_2022.pdf)

[HiPPO: Recurrent Memory with Optimal Polynomial Projections, A. Gu et al, Stanford U., 2020](https://github.com/dimitarpg13/transformers_intro/blob/main/articles_and_books/state_space_models/HiPPO-Recurrent_Memory_with_Optimal_Polynomial_Projections_Gu_2020.pdf)

[Combining Recurrent, Convolutional, and Continuous-time Models with Linear State-Space Layers, A. Gu et al, 2021](https://github.com/dimitarpg13/transformers_intro/blob/main/articles_and_books/state_space_models/Combining_Recurrent_Convolutional_and_Continuous-time_Models_with_Linear_State-Space_Layers_Gu_2021.pdf)

[Diagonal State Spaces are as Effective as Structured State Spaces, A. Gupta, A. Gu et al, 2022](https://github.com/dimitarpg13/transformers_intro/blob/main/articles_and_books/state_space_models/Diagonal_State_Spaces_are_as_Effective_as_Structured_State_Spaces_Gupta_Gu_2022.pdf)

[Hungry Hungry Hippos: Towards Language Modeling with State Space Models, D. Fu, T. Dao, 2023](https://github.com/dimitarpg13/transformers_intro/blob/main/articles_and_books/state_space_models/Hungry_Hungry_Hippos-Towards_Language_Modeling_with_State_Space_Models_Fu_Dao_Stanford_2023.pdf)

[Mamba: Linear-Time Sequence Modeling with Selective State Spaces, A. Gu, T. Dao, CMU, 2023](https://github.com/dimitarpg13/transformers_intro/blob/main/articles_and_books/state_space_models/Mamba-Linear-Time_Sequence_Modeling_with_Selective_State_Spaces_Gu_CMU_2023.pdf.pdf)