1 Conclusion

This paper introduces a novel method for solving dynamic stochastic optimization problems called the Sequential Endogenous Grid Method (EGM^n). Given a problem with multiple decision choices (or control variables), the Sequential Endogenous Grid Method proposes separating the problem into a sequence of smaller sub-problems that can be solved sequentially by using more than one EGM step. Then, depending on the resulting endogenous grid from each sub-problem, this paper proposes different methods for interpolating functions on non-rectilinear grids, called the Warped Homotopic Interpolation Method (WHIM) and the Gaussian Process Regression (GPR) method.

EGM^n is similar to the Nested Endogenous Grid Method (NEGM)[1] and the Generalized Endogenous Grid Method (G2EGM)[2] in that it can solve problems with multiple decision choices, but it differs from these methods in that by choosing the subproblems strategically, we can take advantage of multiple sequential endogenous grid method steps to solve complex multidimensional models in a fast and efficient manner. Additionally, the use of machine learning tools such as the GPR overcomes bottlenecks seen in unstructured interpolation using Delauany triangulation and other similar methods.

[1] Druedahl (2021).
[2] Druedahl and Jørgensen (2017).