

**Option pricing with Chebyshev-Expanded Artificial Neural Networks****Authors:**

- Beatriz Gómez Martín, University of Valladolid ([beatriz.gomez.martin@uva.es](mailto:beatriz.gomez.martin@uva.es))
- Víctor Gatón Bustillo, University of Valladolid ([victor.gaton@uva.es](mailto:victor.gaton@uva.es))

**Abstract:** Pricing different types of options is a subject of interest in finance. Classical numerical methods such as finite difference, finite elements or spectral methods, have been successfully applied to solve pricing problems in low-dimensional cases. However, the mentioned numerical methods suffer from the curse of dimensionality. When working in high-dimensional spaces, or with several underlying stocks, they become inefficient, as the computational cost grows exponentially. Artificial Neural Networks are a good solution to overcome the limitations of the previous methods. In particular, the purpose of this work is to combine the benefits of Artificial Neural Networks with Chebyshev polynomial approximation properties. We will see that applying a Chebyshev polynomial expansion can improve convergence rates of Artificial Neural Networks, providing an interesting framework for option pricing.