

# Numerical calculation of finite random matrix statistics, and the onset of universality

Sheehan Olver

School of Mathematics and Statistics, University of Sydney  
NSW 2006, Australia

Email: sheehan.olver@sydney.edu.au

## Abstract:

The presence of universality as the dimension of random matrices tends to infinity for unitary invariant (UI) ensembles (amongst others) has been well established. For example, the largest eigenvalue tends to the Tracy-Widom distribution for generic UI ensembles. However, the statistics can differ drastically for finite matrices. In this talk, we present an algorithm based on a corresponding Riemann-Hilbert formulation for calculating such finite dimensional statistics. This approach continues to work for non-generic UI ensembles, which do not follow the Tracy-Widom distribution.

## References:

- 1.
- 2.