Project Update – Michael Tehranchi

I have been working on a certain framework for modelling the implied volatility surface. This framework is in the spirit of the Gatheral SVI parametrisation, but is based on a novel observation about the structure of call prices. The key ingredient of my parametrisation is a log-concave density, where the standard normal density recovers the Black—Scholes model. I have recently found a family of densities where all of the relevant calculations (for instance, the shape of the implied volatility for extreme strikes) can be done rather explicitly, yet calibrate very well to the implied volatility surface of S&P call options.

The following papers have been submitted and are currently under review:

A Black-Scholes inequality: applications and generalisation. Available at http://arxiv.org/abs/1701.03897 (revision for *Finance & Stochastics)*

Optimisation-based representations for a class of reaction-diffusion equations. (with D. Driver) Available at http://arxiv.org/abs/1803.09688

I have been invited to present my research at the following conferences:

Advanced Methods in Mathematical Finance. Angers, France. August 2018.

Workshop on Stochastic Dynamical Systems and Ergodicity. Loughborough. July 2018.