Power Quality State Estimation (PQSE) is a set of tools with the objective to monitor power quality in an electric power system. In particular, Transient State Estimation (TSE) estimates voltage waveform from current and voltage measurements.

In this talk an introduction to PQSE and the development to date of TSE using Numerical Integrator Substitution (NIS) will be presented.
Synthetic aperture sonar (SAS) images have an inherent multiplicative speckle noise and are subject to blurring artefacts due to unknown navigational deviations from an ideal sonar track. In multi-pass, a scene of interest is imaged at different times. The images must then be aligned to sub-pixel accuracy in order to perform change detection. Feature matching has recently appeared in SAS literature for coarse registration performed before accurate correlation-based registration. Since feature-based methods are an order of magnitude faster than area-based methods, we wish to explore the limits of their accuracy – can coarse feature-based registration yield sufficient accuracy to perform multi-pass interferometry? Can we improve on the accuracy of SIFT, the unanimous choice of feature detector, in relation to speckle and the coherent image? Can feature-based registration surpass the robustness of correlation when either the navigation drift or temporal decorrelation is significant? The approach is to work with well-behaved simulated data before attempting the greater applications of interest: feature-assisted path correction and coherent change detection.