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**Thesis title:**

Novel analytical and numerical methods for solving fractional dynamical systems.

**Supervisors:**

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**Citation:**

*Fractional partial differential equations are gaining considerable popularity for modelling dynamical systems that exhibit anomalous diffusion, and find widespread application in science, engineering and finance. In this research, novel analytical and numerical methods were developed for solving these types of equations in one and two dimensions. A series of five published papers and one submitted manuscript has been presented on the solution of the space fractional diffusion equation, space fractional advection-dispersion equation, time and space fractional diffusion equation, time and space fractional Fokker-Planck equation with a linear or nonlinear source term, and fractional cable equation involving two time fractional derivatives. These papers formed the backbone of the theory associated with the newly developed numerical methods.*