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**Research areas** : Dye sensitized solar cells

**Title of the research** : Ruthenium doped and Nickel/Nitrogen co-doped TiO<sub>2</sub> for Dye sensitized solar cells

**Current position** : MPhil Student, University of Jaffna, Sri Lanka

**ResearchGate** : <https://www.researchgate.net/profile/Tharmakularasa-Rajaramanan>

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**Description of current and past research:**

The DSSC or Grätzel cell is a low cost solar cell belonging to the group of thin film solar cells. It is based on a semiconductor formed between a photo-sensitized anode and an electrolyte. The general DSSC primarily consists of five main parts in its structure - transparent conductive oxide (TCO) coated glass plate, semiconducting metal oxide, photo-sensitizer, electrolyte redox mediator and counter electrode. Moreover, relaxation and recombination of the injected electron from the dye molecules reduce the device performance. Several strategies are being investigated to overcome the above challenges and improve the PCE of DSSCs. A few of these strategies are placing a compact metal oxide blocking layer on TCO, coating the TiO<sub>2</sub> film with a thin layer of a wide band gap semiconductor, forming composites with TiO<sub>2</sub> electrode, modifying the morphology of nanostructured semiconductors and doping/co-doping the TiO<sub>2</sub> with other elements. Hence, my research work is focusing on doped and co-doped TiO<sub>2</sub> photoanode to enhance the performance of DSSCs.

**Journal publication:**

Rajaramanan, T.; Natarajan, M.; Ravirajan, P.; Senthilnathanan, M.; Velauthapillai, D. Ruthenium (Ru) Doped Titanium Dioxide (P25) Electrode for Dye Sensitized Solar Cells. *Energies* **2020**, *13*, 1532. <https://doi.org/10.3390/en13071532>