

# **Abstract**

**Osama Mohamed Ahmed Hebala**

## **Smart Load Management in Distribution Networks Incorporating Different Load Sectors using PSO**

The excess loads nowadays arising in Egypt brings the monitoring and control of the loads to be the most complicated phenomena facing the electricity utility in Egypt. The main objective of this research is to utilize demand side management (DSM) in order to minimize the peak demand within each of residential, commercial and industrial sectors. This research takes into consideration both utility and customer benefits using particle swarm optimization PSO. Load shifting DSM technique is used to schedule controllable devices of different types at various hours of the day bringing the final load curve closer to an objective load curve. Half hourly forecasted load data and half hourly forecasted pool market price and time of day (TOD) tariff are the inputs given to the DSM program. The proposed algorithm is applied to Alexandria power grid and the simulation results show that the proposed DSM technique comprehends reasonable savings to both utility and consumers simultaneously, while reducing the system peak.