An Introduction to Differential Evolution

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***Abstract*—This talk will introduce the differential evolution algorithm. The presentation will also include parameter-operator adaptation, ensemble methods and population topologies in the context of single objective optimization. If time permits, other optimization scenarios such as constrained, multi-objective, multi-modal, etc. will also be briefly covered. Future research directions will also be suggested.**

***Index Terms*—differential evolution algorithm, single objective optimization**

Ponnuthurai Nagaratnam Suganthan received the BA degree, Postgraduate Certificate, and MA degree in Electrical and Information Engineering from the University of Cambridge, UK in 1990, 1992 and 1994, respectively. After completing his PhD research in 1995, he served as a pre-doctoral Research Assistant in the Department of Electrical Engineering, University of Sydney in 1995–96 and a lecturer in the Department of Computer Science and Electrical Engineering, University of Queensland in 1996–99. He moved to NTU in 1999. He is an Editorial Board Member of the Evolutionary Computation Journal, MIT Press (2013–2018). He is an associate editor of the IEEE Trans on Cybernetics (2012–), IEEE Trans on Evolutionary Computation (2005–), Information Sciences (Elsevier) (2009–), Pattern Recognition (Elsevier) (2001–), Applied Soft Computing (2018–) and Int. J. of Swarm Intelligence Research (2009–) Journals. He is a founding co-editor-in-chief of Swarm and Evolutionary Computation (2010–), an SCI Indexed Elsevier Journal. His co-authored SaDE paper (published in April 2009) won the "IEEE Trans On Evolutionary Computation outstanding paper award" in 2012. His former PhD student, Dr Jane Jing Liang, won the IEEE CIS Outstanding PhD dissertation award, in 2014. His research interests include swarm and evolutionary algorithms, pattern recognition, big data, deep learning and applications of swarm, evolutionary & machine learning algorithms. He was selected as one of the highly cited researchers by Thomson Reuters in 2015, 2016, 2017, and 2018 in computer science. He served as the General Chair of the IEEE SSCI 2013. He has been a member of the IEEE since 1990 and Fellow since 2015. He was an elected AdCom member of the IEEE Computational Intelligence Society (CIS) in 2014–2016. He is an IEEE CIS distinguished lecturer (2018–2020).