Valliappan MUTHUKARUPPAN

Electrical Engineer | Ph.D. Candidate

linkedin.com/in/valliappan-muthukaruppan-6b2274126/
github.com/vmuthuk2 vmuthuk2.github.io
+1 919 917 0140 vmuthuk2@ncsu.edu
Raleigh, NC

I am a passionate and determined researcher with over 4 years of experience and expertise in power system modeling, simulations and computations.

Professional Experience

Present – Jan 2019 | **Ph.D. in Electrical Engineering, North Carolina State University, Raleigh, NC**
Research : DER Management in a Smart Distribution System under Normal and Abnormal Conditions.
Major : Power System Engineering (GPA : **4.0/4.0**).
Minor : Statistics (GPA : **4.0/4.0**).
Advisor : Dr. Mesut E. Baran (NCSU).
Co-Advisors : Dr. Ning Lu (NCSU), Dr. Wenyuan Tang (NCSU) and Dr. David Lubkeman (NCSU).

Dec 2018 – Aug 2016 | **M.S. in Electrical Engineering, North Carolina State University, Raleigh, NC**
Research : Practical Aspects of Implementing a Decentralized Volt-VAR Optimization Scheme.
Major : Power System Engineering (GPA : **4.0/4.0**).
Advisor : Dr. Mesut E. Baran (NCSU).

May 2014 – Aug 2010 | **B.Tech in Electrical and Electronics Engineering, NIT Trichy, India**
Research : Robust Control Scheme for Operating a Nonholonomic Semi-Autonomous Robot.
Advisor : Dr. V. Sankaranarayanan.

Professional Experience

Present – Aug 2017 | **Graduate Research Assistant, FREEDM System Center, NCSU, Raleigh**

- Developed a decentralized volt/var optimization scheme and implemented using Distributed Grid Intelligence software architecture on three different platforms - Hardware, Hardware-in-loop and Software testbed. (*Linux, PSCAD, Modbus, C/C++, Matlab, Wireshark, Computer Networking*)
- Developed AMI based communication scheme for implementing decentralized and distributed volt/var optimization schemes in smart distribution system. (*Matlab*)
- Implemented the decentralized volt/var scheme on embedded system using beagle bone boards and resilient information architecture platform for the Smart Grid (RIAPs). (*Linux, C/C++, Computer Networking*)
- Investigated the impact of a new Dynamic-VAR (DVAR) device on the islanding protection of utility owned PV power plants using Hardware-in-loop simulations and SEL relays for Duke Energy. (*OpalRT, Matlab/Simulink*)
- Developed a stochastic optimization based restoration strategy for residential distribution feeders with high penetration of PV under extreme outages using utility owned mobile energy devices. (*Yalmip, Pyomo, Matlab, Python*)
- Developed a data-driven solution for distribution transformer overloading assessment and a replacement tool for under loaded transformers using smart meter data from a local utility. *(*Python, Pandas)

Matlab | Python | C/C++ | Simulink | Wireshark | Linux | Pyomo | Yalmip | PSCAD | OpalRT

Aug 2019 – May 2019 | **Synchrophasor Distribution Intern, ABB US Corporate Research Center (USCRC), Raleigh**

- Developed a robust re-synchronization strategy for an existing IEEE 9-bus microgrid black start case that was successfully implemented with an ABB relay using Hardware-in-loop simulation. (*Matlab, Simulink, OpalRT*)
- Developed a microgrid model using IEEE 123 system with multiple DERs and micro-PMU's in OpalRT. (*Matlab, Simulink*)
- Investigated the ambiguous requirement of smart inverters to implement both low voltage ride through and islanding detection subject to same disturbance conditions as per IEEE 1547-2018 standard using IEEE 123-node microgrid model. (*Matlab, Simulink*)

Matlab | Simulink | OpalRT

Aug 2017 – Jan 2017 | **Graduate Student Researcher, FREEDM System Center, NCSU, Raleigh**

- Investigated the effect of Negative Impedance Loads (Constant Power Loads) on the stability of microgirds.
- Investigated the effect of the constant power loads on numerical stability of Hardware-in-loop simulations for microgrid.
- Developed different constant power load models in matlab/simulink to stabilize hardware-in-loop simulations of microgrid.

Matlab | Simulink

Jul 2018 – Jan 2017 | **Battery sub-thrust leader, Solarpack, NCSU, Raleigh**

Solarpack - the official Solar Car team of NCSU.

- Served as design lead for Batteries, Battery Protection and Battery Management System for the first version of the solar car.
- Built a custom battery pack at 450V using Toshiba's LTO Cells.
- Developed the Battery Protection System for the vehicle in compliance with the specifications from the American Solar Car Challenge (ASC).

Jun 2016 – Jun 2014 | **Senior Electrical Engineer, Larsen & Toubro Ltd., PT&D IC, Doha, Qatar**

- Lead Erection Engineer responsible for installation and commissioning of power equipments at 132/11kV Doha Festival City Substation (*Net Worth : $23 million*)
- Lead Cable Engineer responsible for installation & testing of 132kV and 11kV power cables inside the substation.
- Successfully commissioned the 132/11kV Doha Festival City Substation on *June 30, 2016*.

Projects

Simply City 2017 - 2018

https://www.simplycity.nc Présentation CES 2018

Simply City est une application mobile, gratuite et participative destinée à tous les habitants, visiteurs et touristes qui séjournent dans une ville. L'application permet de connaître toutes les informations et services utiles en temps réel.

Ionic 3 | Typescript | Javascript | Visual Studio Code

YAAC Another Awesome CV 2013 - 2018

github.com/darwiin/yaac-another-awesome-cv Template sur Overleaf

Template LaTeXpour Curiculum Vitæ utilisant les icônes Font Awesome et la police de caractère Adobe Source Sans Pro. YAAC Another Awesome CV a d'abord été créé comme un template simple pour CV à vocation technologique.

LaTeX | Sublime Text

Publications

2020 V. Muthukaruppan, and M. E. Baran, "Implementing a Decentralized Volt/VAR Scheme on a Smart Distribution System," *IEEE ISGT,* Feb. 2020.

2020 V. Muthukaruppan, and M. E. Baran, "AMI Based Communication Scheme for Decentralized Volt/VAR Control," *IEEE PESGM,* Aug. 2020.

2021 A. Shirsat, V. Muthukaruppan, et. al., "Hierarchical Multi-timescale Framework for Operation of Dynamic Community Microgrid," *IEEE PESGM*, July 2021.

2021 R. Hu, Y. Li, S. Zhang, A. Shirsat, V. Muthukaruppan, et. al., "A Load Switching Group based Feeder-level Microgrid Energy Management Algorithm for Service Restoration in Power Distribution System," *IEEE PESGM,* July 2021.

2022 V. Muthukaruppan, M. E. Baran, et. al., "Overloading Analysis of Distribution Transformers using Smart Meter Data," *accepted IEEE ISGT 2022*.

Skills

Programmation	**Java** (**JEE**, **JSE**, JME, Java Card Platform), Microsoft .Net (**C#**), **Typescript**, Javascript, CSS
Frameworks	Spring, Spring Boot, **Ionic 3**, Angular 2, Angular 4, ZK, JBoss RichFaces
Bases de données	IBM DB2, Oracle Database, Microsoft SQL Server, MySQL, PostgreSQL
Outils de développement	**IntelliJ Idea**, **Eclipse**, Visual Studio Code, Maven, Ant, SVN, git
Middleware	**JBoss EAP**, **Apache Tomcat**, Websphere Application Server (*WAS*)
Systèmes d'exploitation	Mac OS X, Windows Server, Windows 7, Linux Redhat, Linux Centos
Autres	architecture SOA, technologies RFID, NFC et code barre 1D/2D

Programming Languages

Français ●●●●●
Anglais ●●●●○

Forces

- Passioné
- Motivé
- Autonome

Honors and Awards

2007 Master STIC Professionel filière MBDS de l'Université de Nice Sophia Antipolis (Master Informatique spécialité Multimédia, Base de Données et intégration de Systèmes)
2005 Licence Sciences et Technologies, Mention Informatique, de l'Université de Nouvelle-Calédonie
2004 BTS Informatique de Gestion option administrateurs de réseaux
2000 Baccalauréat Scientifique option Mathématiques

Outreach and Volunteering

2007 Master STIC Professionel filière MBDS de l'Université de Nice Sophia Antipolis (Master Informatique spécialité Multimédia, Base de Données et intégration de Systèmes)
2005 Licence Sciences et Technologies, Mention Informatique, de l'Université de Nouvelle-Calédonie
2004 BTS Informatique de Gestion option administrateurs de réseaux
2000 Baccalauréat Scientifique option Mathématiques

Teaching and Mentoring

Aujourd'hui
Décembre 2015

Architecte logiciel | Développeur/Concepteur Senior JEE, EPI, Nouvelle-Calédonie

- Reconstruction de la plateforme d'intégration
- Migration de l'ensemble des projets Java sous Maven
- Evolutions et corrections des bugs du framework de développement interne
- Veille technologique

Apache Tomcat | IntelliJ Idea | Eclipse | Maven | Spring Boot | Jenkins | Nexus

Certifications

2007 Master STIC Professionel filière MBDS de l'Université de Nice Sophia Antipolis (Master Informatique spécialité Multimédia, Base de Données et intégration de Systèmes)
2005 Licence Sciences et Technologies, Mention Informatique, de l'Université de Nouvelle-Calédonie
2004 BTS Informatique de Gestion option administrateurs de réseaux
2000 Baccalauréat Scientifique option Mathématiques

References

Jon Snow
Lord Commander, Night's Watch
@ john.snow@nightwatch.org
+687 987 654

Eddard Stark
King of the North, Winterfell
@ e.stark@winterfell.org
+33 1 23 45 67 90