

WEDNESDAY, November 08, 2017			
Tutorials			
08.30 – 09.15	Registration		
09:15 – 11:00	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;"> <b>Tutorial 1, Session 1</b>  <b>Hall - Coronet-2</b>  <b>Dynamics of Large Grid Operations</b>            Mr. S.K.Soonee, POSOCO         </td> <td style="width: 50%; text-align: center;"> <b>Tutorial 2, Session 1 – Limited to 30 participants</b>  <b>Hall - Utsav</b>  <b>Cyber Physical security and Hands on</b>            Gangaprasad, C-DAC         </td> </tr> </table>	<b>Tutorial 1, Session 1</b> <b>Hall - Coronet-2</b> <b>Dynamics of Large Grid Operations</b> Mr. S.K.Soonee, POSOCO	<b>Tutorial 2, Session 1 – Limited to 30 participants</b> <b>Hall - Utsav</b> <b>Cyber Physical security and Hands on</b> Gangaprasad, C-DAC
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13:00 – 14:00	Tutorial lunch		
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17:30 – 18:00	Break		
18:00 – 20:00	<b>Conference Inauguration:</b> <b>Lamp Lighting</b> <b>Prof. K. Umamaheswara Rao (Director, NITK Suratkal )</b> <b>Mr. Akilur Rahman (CTO, ABB India)</b> <b>Dr. Jim Jefferies (IEEE 2017 President Elect)</b> <b>Mr. Jim Prendergast (IEEE COO, US)</b> <b>Dr. Frank Lambert (IEEE PES, VP, Chapters &amp; NEETREC Georgia Tech)</b> <b>Mr. S.K. Soonee (Advisor, POSOCO &amp; Chair - APPEEC 2017)</b> <b>Sethuraman Ganesan (Convener APPEEC 2017)</b>  <b>Hall – Coronet</b>		
20:00 – 21.00	Inaugural Dinner		

**THURSDAY, November 09, 2017**

THURSDAY, November 09, 2017				
09:00 -09:30	Key note 1 : Frank Lambert - <b>Smart Cities:IEEE PES HQ</b> <b>Hall – Coronet</b> (Organized by NIT-K)			
09:30 - 11:00	Plenary Panel 1: <b>Big Data Analytics for Power &amp; Energy Sector-</b> <b>Hall - Coronet</b> (Organized by NIT-K) Chair: Dr. Gurunath Gurrala, IISc <ol style="list-style-type: none"> <li>1. Dr. Yogesh Narasimhan, CDS, IISc</li> <li>2. Dr. Preetham Yalla, ABB</li> <li>3. Mr. Ramesh Naidu, C-DAC</li> <li>4. Narayanan Raja Gopal, TCS</li> </ol>			
11:00 to 11:30	<b>Tea/Coffee</b>			
11:00 - 11:30 & 13:00 - 14:00	<b>POSTER SESSION-P1 A</b> Coronet-1		<b>POSTER SESSION-P1 B</b> Coronet-2	
	<u>Paper ID</u> <ol style="list-style-type: none"> <li>1. 275</li> <li>2. 533</li> <li>3. 475</li> <li>4. 211</li> <li>5. 455</li> </ol>		<u>Paper ID</u> <ol style="list-style-type: none"> <li>1. 242</li> <li>2. 445</li> <li>3. 462</li> <li>4. 36</li> <li>5. 194</li> <li>6. 398</li> </ol>	
11:30 – 13:00	<b>Panel 1</b> <b>Hall –Coronet -1</b> (Organized by NIT-K) <b>WAMS and PMU</b> <b>Chair: Dr. Nagaraja,PRDC</b> <ol style="list-style-type: none"> <li>1. Dr. Vahid Madani</li> <li>2. Prof. Soman, IITB</li> <li>3. Mr. Jose Thomas, Kalki Tech</li> <li>4. Dr. Krish Narendra</li> </ol>	<b>Paper Session T1 A</b> <b>Hall –Coronet -2</b> <b>Smart Grid</b>  <u>Paper ID</u> <ol style="list-style-type: none"> <li>1. 463</li> <li>2. 287</li> <li>3. 268</li> <li>4. 361</li> <li>5. 79</li> <li>6. 318</li> </ol>	<b>Paper session T1 B</b> <b>Hall –Utsav</b> <b>Micro Grid-I</b>  <u>Paper ID</u> <ol style="list-style-type: none"> <li>1. 263</li> <li>2. 250</li> <li>3. 236</li> <li>4. 256</li> <li>5. 48</li> <li>6. 251</li> </ol>	<b>Paper session T1C</b> <b>Hall - Orchid</b> <b>HVDC</b>  <u>Paper ID</u> <ol style="list-style-type: none"> <li>1. 126</li> <li>2. 443</li> <li>3. 335</li> <li>4. 501</li> <li>5. 149</li> <li>6. 189</li> </ol>
13:00 - 14:00	<b>Conference Lunch</b>			
	<b>POSTER SESSION-P1 A</b> Coronet-1		<b>POSTER SESSION-P1 B</b> Coronet-2	

14:00 – 15:30	<b>Panel-2</b> <b>Hall –Coronet- 1</b> (Organized by NIT-K) <b>Micro Grid, Storage and LVDC</b> <b>Chair: Suresh J</b> <ol style="list-style-type: none"> <li>1. Prof. Thillainathan, New castle, Singapore</li> <li>2. Dev Chandra Kuril, ABB</li> <li>3. Prof. Panduranga Vittal, NIT-K</li> <li>4. Prof. Anupama Kowli, IIT B</li> </ol>	<b>Paper Session T2 A</b> <b>Hall –Coronet -2</b> <b>Distributed Generation</b>  <u>Paper ID</u> <ol style="list-style-type: none"> <li>1. 289</li> <li>2. 302</li> <li>3. 523</li> <li>4. 414</li> <li>5. 521</li> <li>6. 182</li> </ol>	<b>Paper session T2 B</b> <b>Hall - Utsav</b> <b>Protection-I</b>  <u>Paper ID</u> <ol style="list-style-type: none"> <li>1. 66</li> <li>2. 83</li> <li>3. 155</li> <li>4. 329</li> </ol>	<b>Paper session T2 C</b> <b>Hall - Orchid</b> <b>Power Quality</b>  <u>Paper ID</u> <ol style="list-style-type: none"> <li>1. 105</li> <li>2. 142</li> <li>3. 200</li> <li>4. 390</li> <li>5. 436</li> <li>6. 451</li> </ol>
15:00 - 16:00	<b>Tea/Coffee</b>			
15:30 - 16:00 & 17:30 - 18:30	<b>POSTER SESSION-P2 A</b> <b>Coronet-1</b>  <u>Paper ID</u> <ol style="list-style-type: none"> <li>1. 249</li> <li>2. 450</li> <li>3. 207</li> <li>4. 180</li> <li>5. 364</li> <li>6. 358</li> <li>7. 328</li> </ol>		<b>POSTER SESSION-P2 B</b> <b>Coronet-2</b>  <u>Paper ID</u> <ol style="list-style-type: none"> <li>1. 511</li> <li>2. 369</li> <li>3. 473</li> <li>4. 325</li> <li>5. 427</li> <li>6. 283</li> </ol>	
16:00 – 17:30	<b>Panel3</b> <b>Hall –Coronet -1</b> (Organized by NIT-K) <b>Testing, Certification and Compliance Mechanism</b> <b>Chair: Dr. Bhavani Shanker, CPRI</b> <ol style="list-style-type: none"> <li>1. Mr. Ramamohan V Kaki, ADA</li> <li>2. Mr. S. Chandra Kumar, UL India</li> <li>3. Mr. B.V. Govindappa, ASTA</li> </ol>	<b>Paper Session T3 A</b> <b>Hall –Coronet - 2</b> <b>Storage and Mobility</b>  <u>Paper ID</u> <ol style="list-style-type: none"> <li>1. 172</li> <li>2. 260</li> <li>3. 282</li> <li>4. 363</li> <li>5. 444</li> <li>6. 484</li> </ol>	<b>Paper session T3 B</b> <b>Hall - Utsav</b> <b>Power System, Simulation, Operation and Control</b>  <u>Paper ID</u> <ol style="list-style-type: none"> <li>1. 96</li> <li>2. 176</li> <li>3. 347</li> <li>4. 440</li> <li>5. 461</li> <li>6. 472</li> </ol>	<b>Paper session T3 C</b> <b>Hall - Orchid</b> <b>Drives and Machines</b>  <u>Paper ID</u> <ol style="list-style-type: none"> <li>1. 74</li> <li>2. 309</li> <li>3. 338</li> <li>4. 421</li> <li>5. 526</li> <li>6. 534</li> </ol>
17:30 - 18:00	<b>Break</b>			
17:30 - 18:30	<b>POSTER SESSION-P2 A</b> <b>Coronet-1</b>		<b>POSTER SESSION-P2 B</b> <b>Coronet-2</b>	
18:00 - 21:00	<b>Network Dinner</b>			

FRIDAY, November 10, 2017				
09:00 -09:30	Key note 2: <b>Dean Sherafi</b> <b>Hall - Coronet (Organized by NIT-K)</b>			
09:30 - 11:00	Plenary Panel 2: <b>Digitalization of Power System Industry</b> , <b>Session Coordinator: Kannan Tinnium GE</b> <b>Hall - Coronet (Organized by NIT-K)</b>  <ol style="list-style-type: none"> <li>1. Mr. Mariasundaram, GE</li> <li>2. Mr. Anil D'Souza, BESCO</li> <li>3. Mr. Giri Prathivadi, PRDC</li> <li>4. Dr. Ganga Prasad, CDAC</li> </ol>			
11:00 - 11:30	<b>Tea/Coffee</b>			
11:00 - 11:30 & 13:00 - 14:00	<b>POSTER SESSION-P3 A</b> <b>Coronet-1</b>  <u>Paper ID</u> <ol style="list-style-type: none"> <li>1. 343</li> <li>2. 424</li> <li>3. 137</li> <li>4. 344</li> <li>5. 371</li> <li>6. 127</li> <li>7. 278</li> </ol>	<b>POSTER SESSION-P3 B</b> <b>Coronet-2</b>  <u>Paper ID</u> <ol style="list-style-type: none"> <li>1. 162</li> <li>2. 519</li> <li>3. 478</li> <li>4. 147</li> <li>5. 489</li> <li>6. 140</li> </ol>		
11:30 – 13:00	<b>Panel 4</b> <b>Hall –Coronet-1 (Organized by NIT-K)</b> <b>Standards and Standards Development in Power &amp; Energy</b> <b>Chair: Srikanth Chandrasekaran, Sr.Director Standards, IEEE</b>  <ol style="list-style-type: none"> <li>1. Dr. Suresh Konnur, Phillips Lighting</li> <li>2. Amarjeet Kumar, Procubed Inc.</li> <li>3. Dr. Arjit Bose, ABB</li> <li>4. Mr. Sudhakar Reddy, CPRI</li> </ol>	<b>Paper Session T4 A</b> <b>Hall – Coronet-2</b> <b>Renewable Energy</b>  <u>Paper ID</u> <ol style="list-style-type: none"> <li>1. 90</li> <li>2. 106</li> <li>3. 259</li> <li>4. 327</li> <li>5. 411</li> <li>6. 423</li> </ol>	<b>Paper session T4 B</b> <b>Hall - Utsav</b> <b>Micro Grid-II</b>  <u>Paper ID</u> <ol style="list-style-type: none"> <li>1. 415</li> <li>2. 486</li> <li>3. 360</li> <li>4. 215</li> <li>5. 510</li> </ol>	<b>Paper session T4 C</b> <b>Hall - Orchid</b> <b>Power Electronic Converter-I</b>  <u>Paper ID</u> <ol style="list-style-type: none"> <li>1. 33</li> <li>2. 120</li> <li>3. 285</li> <li>4. 291</li> <li>5. 316</li> <li>6. 326</li> </ol>
13:00 - 14:00	<b>Conference Lunch</b>			
	<b>POSTER SESSION-P3 A</b> <b>Coronet-1</b>	<b>POSTER SESSION-P3 B</b> <b>Coronet-2</b>		
14:00 – 15:30	<b>Panel5</b> <b>Hall –Coronet-1 (Organized by NIT-K)</b> <b>Condition monitoring and asset management in power &amp; energy sector</b> <b>Chair: Ravindra Desai, Manager Standards, IEEE</b> <ol style="list-style-type: none"> <li>1. Dr. Ghamandi Lal, BHEL</li> </ol>	<b>Paper Session T5 A</b> <b>Hall – Coronet-2</b>  <b>Protection-II</b>	<b>Paper session T5 B</b> <b>Hall - Utsav</b> <b>Power Electronic Converter - II</b>	<b>Paper session T5 C</b> <b>Hall-Orchid</b> <b>FACTs &amp; HV Engineering</b>

	2. Prof. Subba Reddy, IISc	<b>Paper ID</b> 1. 271	<b>Paper ID</b> 1. 348	<b>Paper ID</b> 1. 58
	3. Mr. Mallikarjunappa, RTD. CPRI	2. 330	2. 399	2. 152
	4. Mr. Umesh Soni, ERDA	3. 376	3. 404	3. 403
		4. 417	4. 448	4. 67
		5. 538	5. 515	5. 449
			6. 543	6. 368
<b>15:30 - 16:00</b>	<b>Tea/Coffee</b>			
<b>16:00 – 17:30</b>	<b>Open Session and Closing Ceremony, Hall</b>			

#### Tutorial -1A

Shri Soonee has first hand four decades of experience of Power System Operation of various Regional Grids of India and has worked extensively towards Integration of State Grids to form Regional Grids and subsequent formation of the National Grid and now SAARC Grid.

He specializes in Power System Operation, Planning, Commercial, Settlement, Restoration and entire gamut of Power Pooling and Governance. Other areas of interest include Electricity Markets, Open Access, Regulatory affairs besides expertise in Load Despatch Technology, integration of Renewable Energy including REC Mechanism, Transmission Pricing and development of Ancillary Services. Institution and capacity building is his passion .

Shri S K Soonee is a Life Fellow of Institution of Engineers (India) , Fellow of IEEE, Distinguished Alumnus IIT Kharagpur, Distinguished Member CIGRE and Fellow of INAE and represented India on the CIGRE Study Committee C2 on Power System Operation and currently represents India on the CIGRE Study Committee C5 on Electricity Markets and Regulation.

## Tutorial -1B

**Dr. Uday Mhaskar** received the Ph.D. degree from the Indian Institute of Technology Bombay in 2003. He is currently working as an Independent Consultant on Energy Storage Solutions. His research interests are in energy storage, power systems & power electronics. He has 14+ years of industry experience. He holds 13 publications and 3 patents.

**Dr. Ajit A. Ghodke** received the B.E. degree in electrical engineering from Walchand College of Engineering, Sangli, Maharashtra, India, the M.E. degree in power systems from University of Pune, Maharashtra, India, and the Ph.D. degree from the Indian Institute of Technology Bombay in 2013.

During 2006-2007, he was working as a Research Assistant with the Indian Institute of Technology Bombay, where he was involved with a project on development of scaled models for study of FACTS, HVDC and power system dynamics, which was sponsored by the Central Power Research Institute, Bangalore, India. Presently, he is working with Schneider Electric India, Bangalore as a Technical Manager. His current research interests are microgrids, distributed generation, multilevel converters, and uninterruptible power supplies. At Schneider Electric, he is currently responsible for the analysis and implementation of microgrid architectures and relevant solutions.

### Abstract of the tutorial on energy storage:

Energy storage system, colloquially called as batteries are used widely, in various domains such as

- 1) Telecom Tower & communication systems;
- 2) Automotive systems (such as Car ignition system, Railway Lightening systems);
- 3) Defence application (Aero warning systems, Missile batteries) ;
- 4) Critical Power application (Data centre, Security & Fire alarm systems);
- 5) Power tools ;

Recent technology advances of electro-chemical systems, not only helped to improve the key design parameters such as Wh/kg, Wh/L, but also improved round trip efficiency, cycle life, & other environmental related aspects. These technology advances gave rise to new battery chemistries & opened up new areas such as Micro-grid, Ancillary services for Electrical power systems. Though the value proposition for new areas is very clear or well understood, mass deployment of energy storage technology (advanced one) still remains a challenge. In this seminar, design & hence economics of energy storage systems is widely discussed.

The first half of seminar develops a basic understanding of various battery (Storage) technologies, & terms that are useful in designing the storage systems. The second half presents

- Cost-benefit analysis of UPS with lithium-ion battery pack;
- Cost-benefit analysis of UPS with lithium-ion system for Data-Center applications.

The tutorial session concludes with some key insights into issues related use of storage systems for PV penetration application.

## Tutorial -2A

Team from C-DAC lead by Dr.Ganga Prasad.

## Abstract of the tutorial on Cyber Physical Systems Security

Cyber Physical Systems are typically designed as a network of interacting elements with physical input and output instead of as standalone devices. Cyber-physical systems are characterized by a tight interaction between their computational and physical components, but add aspects of networking, distributed control, mobility, autonomy, ad-hoc cooperation, and integration with IT-services. The safety and reliability of these systems are more critical. It is necessary to protect as well as strengthen its resilience against natural disasters and inadvertent threats such as equipment failures and user errors.

Smart grids employ advanced monitoring, control, and communication technologies to deliver reliable and secure energy supply, enhance operation efficiency for generators and distributors, and provide flexible choices for consumers. The potential contributions of cyber-physical systems to smart grids, as well as the security challenges that smart grids present to cyber-physical systems are too huge.

Security for Cyber Physical Systems includes critical phases such as Threat identification, analysis & management, Identification of security vulnerabilities, Identification of security approaches using Defense-In-Depth Architecture. Security research and development components namely the Device level security, Advanced Cryptography and Key Management, System/sub system level Security, Network security are required.

- Understanding cyber physical systems
- Cyber physical systems: A smart grid perspective
- Identifying the unique properties of cyber-physical systems and their differences from traditional IT security
- Understanding the threats and possible consequences of attacks
- Attacks against cyber physical systems, cyber infrastructure weakness
- Security concerns for smart grid
- Security mechanisms applicable to cyber-physical systems
- Case study: Attacks on the communication system

## Tutorial -2B

Team from RBCCPS, Indian Institute of Science lead by Dr.Ashish Joglekar.

Ashish Vasant Joglekar was awarded the B.Tech. degree in Electronics and Telecommunication Engineering from [College of Engineering, Pune](#) in 2009 and the Ph.D. degree from the Department of Electronic Systems Engineering, [Indian Institute of Science](#), Bangalore in 2016. His PhD work was titled “Design and practical implementation of novel, low cost, commercially viable Active EMI filters for mitigation of conducted EMI in switched mode power converters.”

His research interests include design for electromagnetic compatibility, switched mode power converters, active EMI filters, sensor analog front-end design, industrial instrumentation and energy harvesting techniques.

Abstract of the tutorial on“Embedded System based Data Acquisition platform:Design and applications for Power Systems (Hands on)”

### **1) Overview of the Embedded Platform:**

We will start the session with a brief overview of the Parallella embedded system. The Parallella is a 5W, 18 core credit card sized computer. The board comprises of a ZYNQ SOC (ARM A9 +FPGA) and a 16 core Epiphany SOC. This unique architecture lends itself well to edge computeand data acquisition applications.

We will be using the desktop edition of the Parallella

(<https://www.parallella.org/parallella-models/>) along with a custom designed extention board.

### **2) Applications in Power Systems:**

We will understand how the features of the Parallella platform can be leveraged to build a high-speed data acquisition system to sample 3 phase V, I data (for power quality analysis).Techniques for interfacing other sensors, actuators will also be explored. This tutorial will cover following topics:

- a) Design of the data acquisition system's analog front end (AFE)
- b) Example high speed ADC SPI interface driver
- c) Example UART interface driver

### **3) Parallella development toolchain (Hands on)**

At the end of the workshop, participants will have an understanding of the Parallella's development toolchain. This should allow them to develop custom applications/drivers on the ARM and FPGA.

### **Requirements:**

- 1) Laptop
- 2) All participants need to have a Xilinx account (<https://www.xilinx.com/registration/create-account.html>)
- 3) Vivado Webpack edition 2014.3.1 (Setup will be provided)