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Tinkering Lab Technical Workshops Series – 2015

Three-Days Hands on Workshop on Modeling and Simulation of Complex Systems

- Organized by Venture Center -

Learn	<ul style="list-style-type: none"> Learn a modeling and simulation tool for any complex chemical, bio-chemical, electronic or mechanical system. 						
Organized by	<ul style="list-style-type: none"> Tinkering Lab at Venture Center 						
Supported by	<ul style="list-style-type: none"> Venture Center Biotechnology Industry Research and Assistance Council (BIRAC) via its BIG mentoring program and SIIP program 						
For whom	<ul style="list-style-type: none"> Students, Researchers & Software Developers in fields like chemical, biochemical, mechanical and electrical 						
When	Thursday- Saturday 7 – 9 January 2016 Time: 0900-1700 hrs						
Where	E-classroom, Venture Center, 100 NCL Innovation Park, Dr. Homi Bhabha Road, Pashan, Pune-411008						
Contact	Ms. Lipika Biswas Phone: +91-20-25865877 Email: eventsdesk@venturecenter.co.in						
Cost	<p>Fees:</p> <table border="1"> <tr> <td>Large companies</td> <td>Rs 5000/-</td> </tr> <tr> <td>Micro, Small, Medium enterprises/ individuals</td> <td>Rs 3000/-</td> </tr> <tr> <td>Students with valid id card/ VC resident companies/ SIIP fellows</td> <td>Rs. 1500/-</td> </tr> </table> <p>*Note: Fees once paid is not refundable under any circumstances</p> <p>25 seats; First come first serve</p> <p>Register online at: http://www.venturecenter.co.in/workshops/</p>	Large companies	Rs 5000/-	Micro, Small, Medium enterprises/ individuals	Rs 3000/-	Students with valid id card/ VC resident companies/ SIIP fellows	Rs. 1500/-
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Introduction

SPICE is a mathematical tool for electronic simulations. However, SPICE has a behavioral modeling building block which can be used to model chemical, biochemical, electronic and mechanical systems. Complex systems which have differential equation based models which are linear or non-linear can be modeled by developers with sufficient domain knowledge. We will look at formulating mathematical models, writing it in the SPICE syntax and running simulations to get results in a very fast and effective way. We will also be looking at different kind of simulations and how to control them.

Workshop Outline

The workshop will include the following:

- Learn SPICE, a text based scripting language
- Different component types : Linear
- Different component types : Non-linear
- Connecting different modules
- Modules
- Libraries and built in functions
- Writing functional modules
- Building hierarchical systems
- Simulations
 - Different Types
 - Control Statements
 - Configuration for accuracy and speed
 - Data Dump and Visualization
- Hands-on
 - Bio-Chemical process example
 - Mechanical process example



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Workshop includes

- Workshop includes tea and lunch at Venture Center Innovation Cafeteria
- Demo and hands on sessions
- One-on-one interactions with the experts
- Certificate of participation issued by Venture Center
- Access to restricted website with online compilation of resources for 1 month
- Membership in mailing list to other workshops by Venture Center
- **Participants need a laptop with install permissions**

***Please note, the participants will have to arrange for their own travel/local transport and accommodation.**

- For accommodation (standard and budgeted hotels) please visit:
<http://www.venturecenter.co.in/puneguide/standard.php>
- For accommodation (deluxe and luxury hotels) please visit:
<http://www.venturecenter.co.in/puneguide/deluxe.php>
- For local transport details visit:
<http://www.venturecenter.co.in/puneguide/taxi.php>



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Workshop Schedule

Time (hrs)	Topic and Contents	Venue	Faculty
Day1:			
0900-0915	Registration	Foyer area	
0915-0930	Introduction to Venture Center and the workshop	E-classroom	Dr. Premnath V
0930-1030	Introduction to SPICE	E-classroom	Subhojit Basu
1030-1045	Tea/coffee and biscuits	Foyer area	
1045-1130	Linear elements in SPICE	E-classroom	Subhojit Basu
1130-1300	Hands-On session: <ul style="list-style-type: none"> • Linear Element based models • Basic steady state simulation • Basic Dynamic Simulation 	E-classroom	Subhojit Basu
1300-1400	Lunch	Cafeteria	
1400-1530	<ul style="list-style-type: none"> • Mathematical models of systems • Modeling Techniques • Algebraic equation based • Differential Equation Based • Arbitrary function based model 	E-classroom	Subhojit Basu
1530-1600	Tea/coffee and biscuits	Foyer area	
1600-1700	Why do simulations fail? <ul style="list-style-type: none"> • Solvability of Equations • Convergence issues 	E-classroom	Subhojit Basu
Day 2:			
0900-1100	Case Study and sharing of experiences	E-classroom	Anant Patki
1100-1115	Tea/coffee and biscuits	Foyer area	
1115-1300	Modeling <ul style="list-style-type: none"> • Learn about Non-Linear Elements • Behavioral Models 	E-classroom	Subhojit Basu
1300-1400	Lunch	Cafeteria	
1400-1530	Hands-On session: <ul style="list-style-type: none"> • Steady State simulations • Dynamic Simulations 	E-classroom	Subhojit Basu
1530-1600	Tea/coffee and biscuits	Foyer area	
1600-1700	<ul style="list-style-type: none"> • Large Simulations • Simulation Result analysis 	E-classroom	Subhojit Basu
Day 3:			
0900-1100	Data Dump and plotting	E-classroom	Subhojit Basu
1100-1115	Tea/coffee and biscuits	Foyer area	
1115-1300	Introduction to various simulation types <ul style="list-style-type: none"> • Simulation Types 	E-classroom	Subhojit Basu



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	<ul style="list-style-type: none"> Control Settings 		
1300-1400	Lunch	Cafeteria	
1400-1530	Hands-On session: <ul style="list-style-type: none"> Relook at Steady State Simulations Relook at Transient Simulations Optimization simulation Monte-Carlo Simulation 	E-classroom	Subhojit Basu
1530-1600	Tea/coffee and biscuits	Foyer area	
1600-1715	Question and Answer Session for clearing doubts	E-classroom	Subhojit Basu
1715-1730	Feedback and Valedictory	E-classroom	V. Premnath

Speakers (in alphabetical order of last names)

 Subhojit Basu	<p>Subhojit has spent his work years in VLSI Design, EDA and Multicore Processor Design and Multicore Computing, Analog and Digital Domains and Embedded systems. Currently he is working towards building a low-cost Myoelectric Prosthetic. Earlier, he worked on his own startup ANTFarm Robotics focusing on Wireless Sensor Networks. Subhojit was awarded the Indian National Mathematical Olympiad '98 for his outstanding mathematical abilities. He was also showcased in several TV shows, most notable being CNBC-TV18 Youngturks in 2013. Subhojit has a B. Tech (Electrical Engg.), M. Tech (Instrumentation) from IIT, Kharagpur.</p>
 Anant Patki	<p>Mr. Patki is a B E (Mech) and M E(Aeronautics) from IISc, Bangalore with over 45 yrs experience in R&D, academics and industry. He worked in ISRO from 1967-2003 as Aerospace Scientist & was associated with most of ISRO's major projects in different capacities. He was also named 'Outstanding Scientist' at Dept of Space, ISRO Satellite Center, Bangalore. He is visiting Professor at Dept of Aerospace Engg of IIT-B, visiting Professor at Dept of Aerospace Engg of IISc, Bangalore, and distinguished visiting Professor, INAE. He has expertise in structural mechanics, heat transfer, design, statistics, system engg; Math Modeling; Statistics, Risk modeling, Performance Studies; Six Sigma, Reliability Engg etc. Post retirement he has worked at Integrated Engineering Solutions group of Satyam Computer Services Ltd and currently is a freelance consultant since April 2009.</p>
 Premnath Venugopalan	<p>Premnath is Founding Director of Venture Center and Head, NCL Innovations. He holds a B.Tech from the Indian Institute of Technology - Bombay and a Ph.D. from the Massachusetts Institute of Technology, USA. He has also been a Chevening Technology Enterprise Fellow with the Centre for Scientific Enterprises, London Business School and Cambridge University, UK. He brings with him considerable experience in technology development and commercialization, working with start-up companies (in Cambridge-UK and India) and engaging with large corporations on research and consulting projects as project leader.</p>



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About the Organizer



Entrepreneurship Development Center (Venture Center) – a CSIR initiative – is a Section 25 company hosted by the National Chemical Laboratory, Pune. Venture Center strives to nucleate and nurture technology and knowledge-based enterprises by leveraging the scientific and engineering competencies of the institutions in the Pune region in India. The Venture Center is a technology business incubator supported by the Department of Science & Technology's National Science & Technology Entrepreneurship Development Board (DST-NSTEDB). Venture Center's focuses on technology enterprises offering products and services exploiting scientific expertise in the areas of materials, chemicals and biological sciences & engineering. For more information, visit <http://www.venturecenter.co.in/>



The BioIncubator at Venture Center aims to nucleate and nurture technology and knowledge-based enterprises leveraging knowledge in the areas of biotechnology (biopharma, agrobiotech, industrial biotech, clean technology), biomedical engineering/ devices/ diagnostics, biomass value addition/ renewable fuels/chemicals/materials, bioinformatics, bio/medical services and related disciplines.

Created with support from DBT-BIRAC under the Bioincubator Support Scheme.

For more information, visit <http://www.bioincubator.venturecenter.co.in/>



Tinkering Lab is a facility at Venture Center. This Venture Center initiative has been created with the generous support from in-house funds from Venture Center and the host Institution. The focus in the Tinkering Lab is on electronics, instrumentation and optics besides related prototyping and design.

The main aim of the Tinkering Lab is to help inventors and entrepreneurs to build prototypes of their ideas and generally "tinker" around exploring new ideas.

For more information, visit <http://www.venturecenter.co.in/tinkeringlab/>