

Logic Design of Quantum Circuits and Memristor-based Systems

8th-12th August, 2016

You Should Attend If

You are an electronics / computer science student or research scientist interested to learn logic design aspects of quantum circuits, and also for memristors based systems or you are a working professional wishing to upgrade your knowledge to the couple of emerging technologies covered as part of the course.

Registration Details:

Please register using the following link:
<http://www.gian.iitkgp.ac.in/GREGN/index>

Select our course and make payment using the following details:

Payment Mode: NEFT/RTGS/Fund Transfer
A/C no: NITMEG First name of the applicant
Date of Birth (DDMMYY)GIAN

For Example: If an applicant's name is Anup Ghosh and date of birth is 12-06-1984. Beneficiary account number will be : NITMEGANUP120684GIAN

Beneficiary Name : NIT Meghalaya fee account
IFSC Code : HDFC0000240
Branch Name : Sandoz Branch

Registration Fee:

Academic : Rs. 5000/-
Industry/Research : Rs. 10000/-
International : USD 300

Last date: 31st July, 2016

Principal Coordinator

Dr. Kamalika Datta

Assistant Professor
Department of Computer Science and Engineering
National Institute of Technology Meghalaya
Bijni Complex, Laitumkhrach
Shillong 793003, Meghalaya

Email: giannitmeghalaya@gmail.com



Global Initiative of Academic Networks and National Institute of Technology Meghalaya Initiative

Venue:

National Institute of Technology Meghalaya, Shillong

Design by: Ritu Ranjan Shrivastwa

SCHEDULE

Module A: Introductory Module Aug 08

INAUGURATION (9:00 - 9:30)

Lecture 1: (9:30-10:30 & 10:45-11:45) -- 2 hours
Evolution of logic design techniques over the years (conventional approach, binary decision diagram, Multiplexer based synthesis)

Lecture 2: (14:00-15:00 & 15:15-16:15) -- 2 hours
Other non-conventional logic design methodologies (Reed-Muller canonical form, exclusive-OR sum of Products form, threshold logic)

Module B: Quantum circuits and their design Aug 09

Lecture 3: (9:30-10:30 & 10:45-11:45) -- 2 hours
Basics: Quantum circuits, reversible circuits
Lecture 4: (12:00-13:00) -- 1 hour
Design of quantum circuits

Aug 10

Lecture 5: (9:30-10:30) -- 1 hour
Physical architectures and constraints
Lecture 6: (10:45-11:45 & 12:00-13:00) -- 2 hours
Methods for proper technology mapping

Aug 11

Lecture 7: (Aug 11, 9:30-10:30) -- 1 hour
Demonstration of decomposition, mapping and optimisation tools

Module C: Logic design using Memristor Aug 11

Lecture 8: (10:45-11:45) -- 1 hour
Introduction to Memristor, principle of operation memristor simulation models, memristor fabrication

Aug 12

Lecture 9: (9:30-10:30 & 10:45-11:45) -- 2 hours
Logic design techniques using memristors, implementing IMPLY function using memristors
Lecture 10: (12:00-13:00) -- 1 hour
Memristor crossbar array, issues and sneak path avoidance, using memristors to build threshold logic gates, applications to neuromorphic computing
Mid Term Test: Aug 10, 15:00-16:00
End Term Test: Aug 12, 15:00-17:00

SPEAKERS



Prof. Bhargab B. Bhattacharya

is a Professor of Computer Science and Engineering in the Advanced Computing and Microelectronics Unit, Indian Statistical Institute Calcutta. His research interests include VLSI design and test, VLSI physical design, nanotechnology and giga-scale integration.



Prof. Robert Wille

is a Full Professor in the Institute for Integrated Circuits, Johannes Kepler University Linz, Austria. His research interests include reversible and quantum computing, and development of design technologies with particular focus on the design, verification and test of circuits and systems, for both conventional and emerging technologies



Dr. Kamalika Datta

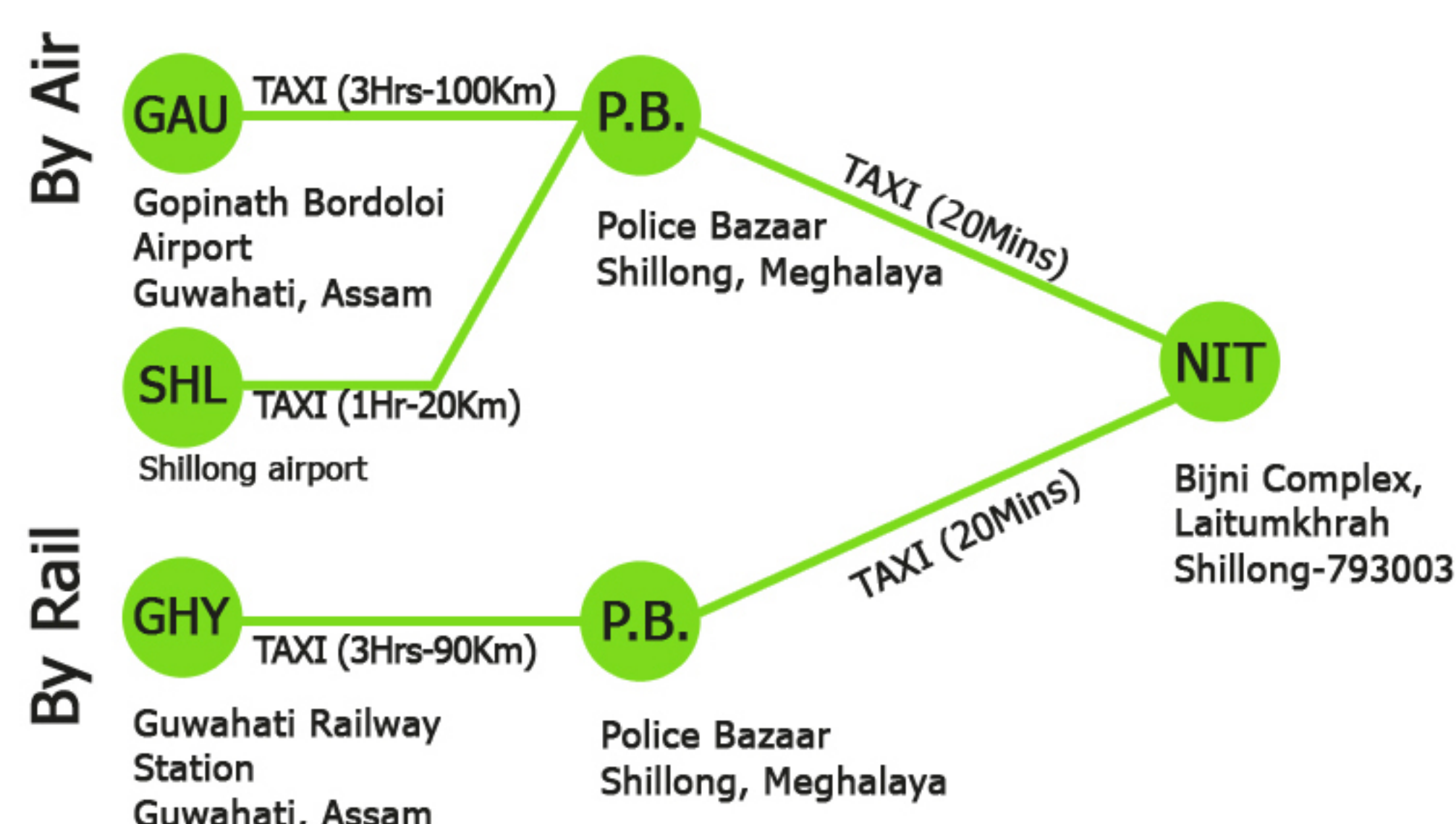
is an Assistant Professor in the Department of Computer Science and Engineering, National Institute of Technology Meghalaya. Her research interest include reversible and quantum circuit synthesis and optimization, memristors-based system design, and embedded systems.

OBJECTIVE

The primary objectives of the course are to expose the participants to the following:

- Evolution of logic design paradigm over the years, and emerging technologies like quantum circuits and memristors.
- Design and optimization of quantum circuits for logic design applications.
- Physical architectures and constraints in the design of quantum circuits, and the corresponding technology mapping.
- Working principles of memristors and their use in logic design and neuromorphic computing applications.

How To Reach NIT Meghalaya



About

NIT meghalaya

The National Institute of Technology Meghalaya is one among the thirty NITs in India established under the NIT Act 2007 (Amended 2012) of the Parliament of India as Institutes of National Importance with full funding support from the Ministry of HRD, Government of India. NITM work towards building excellence in academic activities with focus in research and development. The major focus is to contribute in the field of science and technology which in turn helps in developing the state, the region and the nation.

<http://www.nitmeghalaya.in>