ALAKESH KALITA

github.com/Alakesh1025 alakesh.kalita1025@gmail.com
Manikpur, Bongaigaon, Assam, 783392, India 8402802840

EDUCATION

Indian Institute of Technology Guwahati, India *January 2018– Till*
***Pursuing Ph.D.**, Industrial Internet of Things,*
Thesis Title: *Adaptive Resource Allocation for Faster Formation of 6TiSCH Network*
Objectives: The main objective of this work is to make the 6TiSCH network formation process faster by providing various resource such as bandwidth, transmission opportunity, controlling the transmission rate of various control packets depending on network situation.

- Proposed a Markov Chain-based model for analyzing the node joining process in a multihop 6TiSCH network.
- A channel condition based dynamic beacon interval (C2DBI) scheme is proposed for efficient joining of nodes in 6TiSCH network based on channel congestion status.
- Identified and analytically proved the demerits of EB's highest priority, absence of routing information, and uncertainty of shared channel access during bootstrapping in 6TiSCH network.
- An opportunistic priority alternation and rate adjustment (OPR) scheme is proposed to deal with the demerits of EB's highest priority and absence of routing information.
- An opportunistic channel access (OCA) scheme is proposed to transmit urgent packets with minimum delay.
- An autonomous minimal cell allocation scheme (ALLOT) is proposed for faster transmission of control packets to all nodes.
- A hierarchical odd-even minimal cell scheduling scheme (CHOICE) is proposed along with *ALLOT* for maintaining synchronization between a sender and a receiver in a network
- All the proposed schemes are evaluated by means of simulation and real Testbed experiments.

Assam Central University, India *July 2014 - May 2016*
***Master of Technology**, Computer Science and Engineering,*
CGPA: 8.34/10
Thesis Title: *A Fault Tolerant Topology For Network-on-Chip*
Objectives: The main objective of this work was to design a new topology for NoC by keeping in mind the factors such as minimum chip area, high throughput, minimum latency and path diversity. Other tasks were to design an adaptive routing algorithm for the proposed topology and to make it fault tolerant.

- A novel topology was designed for NoC, which provides low latency, better throughput and high path diversity by consuming less chip area.
- An adaptive routing algorithm was proposed for the proposed topology which changes the routing path depending on loads in each IP core.
- Adding few spare routers dynamically during run time, the proposed topology was made fault tolerant.

Assam Don Bosco University, India *July 2008 - June 2012*
***Bachelor of Technology**, Computer Science and Engineering,*
CGPA: 7.26/10
Thesis Title: *Developing a Network and System Monitoring Controller*
Objectives: The main objective of this work was to develop a network monitoring application using JAVA programming language.

- The developed application allows the network administrator to simultaneously monitor different user systems such as which application is running, how much CPU is being used, what is the system hard drive storage status etc., at a time.

- The application also allows the network administrator to control user system remotely.
- Furthermore, the application allows the network administrator to block user USB port, specific network packet such as UDP or TCP.

Abheshwari H.S and M.P. School *2006 - 2008*
*Class: (**10+2**), Percentage: 73%*

Manikpur H.S. School, Assam, India *2005 - 2006*
*Class: **10**, Percentage: 76.83%*

WORK EXPERIENCE

Indian Institute of Technology Guwahati, India *January 2018 - Till*
Research Scholar

Indian Institute of Information Technology Guwahati, India *July 2017 - December 2017*
Research Scholar & Junior Research Fellow

North-Eastern Hill University, Shillong, India *August 2016 - June 2017*
Project Scientist

Shriram Transport Finance Company Ltd. *September 2012 - October 2013*
Management Trainee

TEACHING ASSISTANTSHIP

Indian Institute of Technology Guwahati, India *2018 - Till*

- CS101: Introduction to Computing Lab (C Programming), January - July, 2018
- CS343: Data Communication, July - December, 2018
- CS348: Computer Networks, January - July, 2019, 2020
- CS578: Internet of Things, July - December, 2019

Assam Central University, India *2015 - 2016*

- C Programming Lab

PUBLICATIONS

Journals

- **A. Kalita** and M. Khatua, "Channel Condition Based Dynamic Beacon Interval for Faster Formation of 6TiSCH Network," in **IEEE Transactions on Mobile Computing**, **IF-4.47, Rank-**A^* (**Accepted**), Link
- **A. Kalita** and M. Khatua, "Opportunistic Transmission of Control Packets for Faster Formation of 6TiSCH Network," in **ACM Transactions on Internet of Things**, (**Under minor revision**)
- **A. Kalita** and M. Khatua, "Autonomous Allocation and Scheduling of Minimal Cell in 6TiSCH Network," in **IEEE Internet of Things Journal**, **IF-9.51** (**Under major review**)

Conferences

- **A. Kalita** and M. Khatua, "Opportunistic Priority Alternation Scheme for Faster Formation of 6TiSCH Network," in 21st International Conference on Distributed Computing and Networking (ICDCN), Jan 2020, pp. 1-5. Link
- **A. Kalita** and M. Khatua, "Faster Joining in 6TiSCH Network using Dynamic Beacon Interval," in 11th International Conference on Communication Systems Networks (COMSNETS), Jan 2019, pp. 454–457. Link
- **A. Kalita**, N. Ahmed, H. Rahman, and M. I. Hussain, "A QoS-aware MAC protocol for large-scale networks in Internet of Things," in 2017 IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS), Dec 2017, pp. 1–6. Link

- **A. Kalita**, K. Ray, A. Biswas, and M. A. Hussain, "A topology for network-on-chip," in 2016 International Conference on Information Communication and Embedded Systems (ICICES), Feb 2016, pp. 1–7. Link
- K. Ray, **A. Kalita**, A. Biswas, and M. A. Hussain, "A multipath networkon-chip topology," in 2016 International Conference on Information Communication and Embedded Systems (ICICES), Feb 2016, pp. 1–7. Link
- A. Biswas, M. A. Hussain, and **A. Kalita**, "An improved congestion free modified fat tree network," in 2016 International Conference on Signal Processing, Communication, Power and Embedded System (SCOPES), Oct 2016, pp. 759-763. Link
- **A.Kalita**, A. Biswas, Md. Anwar Hussain, "A Multipath Fault Tolerant Topology for Network-On-Chip," accepted in Springer, International Conference on Computing and Communication Systems 2016 (I3CS2016)-2016.(**Withdrawn)**

WORKSHOP & TRAINING

- An active volunteer of in the organizing committee of the 3^{rd} ISEA International Conference on Security and Privacy (ISEA-ISAP 2020) in IIT Guwahati from 27 Feb - 1 Mar 2020
- An active member of organizing committee in two days workshop on "Internet of Things: It's Inside Out" at NEHU, Shillong, Meghalaya from 12 May - 13 May, 2017
- Faculty Development Programme (FDP) in "Cloud Computing with AWS" in association with IIIT Guwahati , oraganized by E&ICT Academy at IIIT Guwahati from 05 Dec - 10 Dec, 2016
- Two days workshop on "Internet of Things: A Gateway to Smart and Intelligent Future" at NIT Meghalaya, organized by E&ICT Academy in 2016
- Fifteen days Summer Training on Networking at IOCL, Bongaigaon in 2011

ACHIEVEMENTS & AWARDS

- Received travel grant to attend ICDCN'2020 conference from IIT Guwahati, India.
- Qualified NET'2019 with 98.9 percentile
- Received travel grant to attend COMSNETS'2019 conference from the conference organizer
- MHRD scholarship for Ph.D. (2018-till)
- Bagged second prize in Regional Innovators Conclave conducted by Government of Meghalaya for the "Smart Lighting Model", Meghalaya, India 2017
- Qualified GATE'2017
- TEQIP-II scholarship during M-Tech (2014-2016)
- Bagged first prize in line follower robotics competition, was held in Assam University, India 2016

TECHNICAL SKILLS

Technical Skill:	Testbed setup
Programming:	C, C++
Documentation language:	LaTeX, Microsoft Word
Databases:	MySQL
Software & Tools:	**Operating System:** Windows, Linux **Network Simulator:** Cooja, OMNeT++, NS-3 **IDE:** NetBeans, Arduino, MATLAB, VB

PROFESSIONAL MEMBERSHIP

- ACM student membership since November 2019 (ID: 9926691)

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Date: 24/08/2020
Place: IIT Guwahati

Signature