

**CHETNA SINGHAL, Ph.D.**  
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## ACADEMIC DETAILS

### Indian Institute of Technology Delhi

Ph.D., May 2015

- Dissertation Topic: *User-centric multimedia broadcast techniques over wireless*
- Keywords: Energy efficiency; QoE; multimedia broadcast; heterogeneous users; device battery capacity; channel condition; screen resolution; price and energy sensitivity; heterogeneous networks
- Supervisor: Prof. Swades De

M.Tech., Computer Technology, July 2010

- Thesis Topic: *Development of power line communication (PLC) based gateway controller for in-cabin infotainment*
- Keywords: Android; infotainment system; gateway controller; Power Line Network/Communication
- Supervisor: Prof. Subrat Kar
- 9.5 CGPA. *Highest CGPA. Academic excellence award for securing highest CGPA among Post Graduate Students.*

### Army Institute of Technology, University of Pune

B.Eng., Electronics and Telecommunication, June 2008

- *University Gold Medal for securing first rank in University of Pune.*

### Loreto Convent Delhi, Central Board of Secondary Education (CBSE)

Intermediate/+2 (AISSCE) in 2004, Matriculation (AISSE) in 2002

- *Secured highest overall marks in school.*

## WORK EXPERIENCE

- Assistant Professor (TT) at E&ECE, IIT Kharagpur (Feb., 2016 – present).
- Visiting Assistant Professor at E&ECE, IIT Kharagpur (Oct., 2015 – Feb., 2016).
- Visiting Researcher at DET, Politecnico di Torino, Italy (Dec. 2015, May 2016 - Jul. 2016, Dec. 2016).
- Research Associate at EE, IIT Delhi (Sep., 2014 – Oct., 2015): Working on research in the area of multimedia transmission over wireless.
- Teaching/Research Assistant at EE, IIT Delhi (July, 2011 – Sep., 2014 and July, 2008 – June, 2010): Assisted in Wireless Communications term-project assessments (PG), Communication systems lab (UG), Digital Communications lab (UG), Communication systems tutorial (UG), Introduction to Electronics tutorial (UG).
- Visiting Researcher at The Rince Institute, Dublin City University, Ireland (Aug., 2013 – Oct., 2013): Worked towards mobile devices' battery energy discharge experiments and new research ideas for user-centric broadcast over wireless.
- Associate Software Engineer at IBM-ISL (Software Lab) (09 June, 2010 – 11 July, 2011): Worked with iRAD (IBM Rational Application Developer) - Portal Tools team, towards development, testing, and debugging of the software's portal tools component.

## COURSES TAUGHT

- Courses taught at IIT Kharagpur: Multimedia systems and applications, Digital voice and picture communication
- Labs conducted at IIT Kharagpur: Basic Electronics, Microcontroller systems, Network theory, Digital Signal Processing
- GIAN course (as coordinator): Principles and Technologies for 5G systems
- Short-term course (as co-coordinator): Multimedia Systems and Applications

## AWARDS AND SCHOLASTIC ACHIEVEMENTS

- DST Inspire Faculty Award 2015.
- ITRA PhD Dissertation Award 2015.
- Travel grant awarded by Microsoft Research (MSR) India, for participating in IEEE Intl. Symp. World of Wireless Mobile and Multimedia Networks (WoWMoM) 2015, Boston, USA.
- Travel grant awarded by Department of Science and Technology (DST), for participating in IEEE Intl. Conf. on Communications (ICC), 2014, Sydney, Australia.
- Student Travel grant awarded (of US\$750) by the IEEE Communications Society to attend IEEE ICC 2014.

- **First prize in poster presentation** on Ph.D. research work at IIT Delhi research scholars' day, 2014 from among all the nominated Ph.D. scholars in the institute.
- **Highest CGPA in M.Tech Computer Technology**, IIT Delhi, 2008-2010 batch.
- **Academic excellence award**, 2009-2010, IIT Delhi for securing highest CGPA among all the Post Graduate Students.
- Following awards for securing highest marks and standing first at the B.Eng in Electronics & Telecommunication (E & TC) Examination, University of Pune in 2008.
  1. **Pune University Gold Medal** - The Late Shri Govind Kashinath Wani Gold Medal.
  2. **Cash Prizes** - The Principal G.K. Ogale Memorial Prize, The Prof. S.V.C.Ayyaya Prize, and The P.R.Bastikar Memorial Prize
- **Gold medal and Certificate of Merit** awarded at Army Institute of Technology for securing first rank in B.Eng. (E & TC) Examination of the University of Pune 2008.
- **Rank holder of University of Pune**: first rank in B. Eng. (E & TC) examination in 2008, first rank in third year of Eng. (E & TC) examination in 2007, third rank in second year of Eng. (E & TC) in 2006.
- **Merit awards of Army Institute of Technology**, Pune: secured first rank in first, second, third year and B.Eng. (E&TC) 2004-2008.
- **Express Readers South Merit scholarships**: awarded scholarships Rs. 25,000/- each for securing first rank in order of merit in first year, second year, third Year (E & TC).

## REFEREED PUBLICATIONS

### • Journals

1. P. Barik, C. Singhal, and R. Datta, "Energy Efficient D2D Based Relay-Assisted Communication in Cellular Networks," **submitted to *IEEE Wireless Communications Letters***, Jan. 2018.
2. C. Singhal, and S. De, "SURE-TV: Scalable, User-centric, Revenue aware, Energy-efficient HDTV Broadcast," **under revision for *IEEE Trans. Mobile Computing***, 2017.
3. C. Singhal, and S. De, "eM-SON: Efficient Multimedia Service over Self-Organizing Wi-Fi Network," **under revision for *IET Networks***, 2017.
4. C. Singhal, S. De, and U. P. Moravapalle, "Optimized mesh routing with intermediate recovery for error resilient delivery of MD coded image/video content," *Computer Communications*, 2017 (accepted, in Press, Nov. 2017).
5. C. Singhal, and S. De, "Energy-Efficient and QoE-Aware TV Broadcast in Next-Generation Heterogeneous Networks," *IEEE Commun. Magazine*, vol. 54, no. 12, pp. 142-150, Dec. 2016.
6. C. Singhal, and S. De, "User-Centric Energy-Efficient Multimedia Multicast/Broadcast Solutions : A Survey," *ICST (EAI Endorsed) Trans. on Ubiquitous Environments*, vol. 15, no. 5, May 2015.
7. C. Singhal, S. De, R. Trestian, and G. M. Muntean, "eWU-TV: Energy Efficient, Wi-Fi based User-centric Digital Television Broadcast," *IEEE Trans. Broadcasting*, vol. 61, no.1, pp. 39-55, Mar. 2015.
8. C. Singhal, S. De, R. Trestian, and G. M. Muntean, "Joint Optimization of User-Experience and Energy-Efficiency in Wireless Multimedia Broadcast," *IEEE Trans. Mobile Computing*, vol. 13, no.7, pp. 1522-1535, July 2014.
9. C. Singhal, S. Kumar, S. De, N. Panwar, R. Tonde, P. De, "Class-based Shared Resource Allocation for Cell-Edge Users in OFDMA Networks," *IEEE Trans. Mobile Computing*, vol. 13, no.1, pp. 48-60, Jan. 2014.

### • Conferences

1. S. Tipugade, and C. Singhal, "Adaptive Multimedia Streaming between Heterogeneous Users using D2D and Dynamic Wi-Fi Configuration," in *IEEE ICNC*, Mar. 2018, Hawaii, USA.
2. R. B. Chenna, C. Singhal, and S. De, "MDTC Video Transmission using Channel Aware Multipath Routing in Wireless Mesh Networks," in *ACM ICDCN*, Jan. 2018, Varanasi, India.
3. C. Singhal, and G. Tadepalli, "Machine Learning Based Subjective Quality Estimation for Video Streaming over Wireless Networks," in *Proc. IEEE WPMC*, Dec. 2017, Yogyakarta, Indonesia.
4. C. Singhal, and A. Sahu, "UHD Video Transmission Using Adaptive SHVC in Wireless Networks," in *Proc. IEEE WPMC*, Dec. 2017, Yogyakarta, Indonesia.
5. P. Barik, C. Singhal, and R. Datta, "Throughput Enhancement Using D2D Based Relay-Assisted Communication in Cellular Networks," in *Proc. IEEE PIMRC*, Oct. 2017, Montreal, Canada.
6. C. Singhal, C. F. Chiasserini and C. Casetti, "Efficient Multimedia Broadcast for heterogeneous users in cellular networks," in *Proc. IEEE Int. Wireless Commun. and Mobile Comp. Conf. (IWCMC)*, pp. 315-320, Sep. 2016, Paphos, Cyprus.
7. C. Singhal, S. De, and H.M. Gupta, "U-TV: User-centric Scalable DTV broadcast over Heterogeneous Wireless Networks", in *Proc. IEEE Intl. Symp. World of Wireless Mobile and Multimedia Networks (WoWMoM)*, Boston, USA, June 2015.
8. C. Singhal, R. Trestian, S. De, and G. M. Muntean, "eSMART: Energy-efficient Scalable Multimedia Broadcast for Heterogeneous Users", in *Proc. IEEE WoWMoM Workshop on Video Everywhere*, Sydney, Australia, June 2014.
9. C. Singhal, S. De, and H.M. Gupta, "User Heterogeneity and Priority Adaptive Multimedia Broadcast over Wireless", in *Proc. IEEE Intl. Conf. Commun.*, Sydney, Australia, June 2014.
10. C. Singhal, and S. De, "ePAB: Energy-efficient, User-Preference Based Adaptive Multimedia Broadcast", in *Proc. IEEE Nat. Conf. Commun.*, Kanpur, India, Feb. 2014.
11. C. Singhal, S. De, and H. M. Gupta, "Users-Capability based Adaptive Energy-Saving Scheme for Wireless Multimedia Broadcast", in *Proc. ICEIT Conf. on Advances in Mobile Commun., Netw. and Computing*, Sep. 2013, Delhi, India.

- Book
  1. C. Singhal and S. De, "Resource Allocation in Next-Generation Broadband Wireless Access Networks", IGI Global. Feb. 2017.
- Book Chapters
  1. S. Swayamsiddha, C. Singhal, and R. Roy, "Nature-Inspired-Algorithms-Based Cellular Location Management" in *Handbook of Research on Modeling, Analysis, and Application of Nature-Inspired Metaheuristic Algorithms*. IGI Global. Oct. 2017.
  2. C. Singhal, and P. Barik, "Adaptive Multimedia Services in Next-Generation Broadband Wireless Access Network" in *Resource Allocation in Next-Generation Broadband Wireless Access Networks*. IGI Global. Feb. 2017.
  3. C. Singhal and S. De, "Resource Allocation in Heterogeneous Broadband Wireless Access Networks" in *Convergence of Broadband, Broadcast, and Cellular Network Technologies*. IGI Global. 2014.

## RESEARCH INTERESTS

- Handoff schemes and cross-layer optimization in wireless networks, user-centric and energy-efficient multimedia transmission, adaptive multimedia multicast and broadcast schemes and technologies, resource allocation in next-generation heterogeneous networks, and robust multimedia delivery in MANETs, quantum computing.

## CURRENT SPONSORED PROJECTS

1. **Project Title** : Application-driven QoS improvement for mobile users in Heterogeneous networks  
**Principal Investigator** : Chetna Singhal  
**Sponsor** : DST Inspire faculty research fellowship
2. **Project Title** : Ubiquitous Multimedia service over Self-Organizing Wireless Networks  
**Principal Investigator** : Chetna Singhal  
**Sponsor** : Institute scheme for innovative research and development (ISIRD), IIT Kharagpur

## POSITIONS OF RESPONSIBILITY AND OTHER PROFESSIONAL ACTIVITIES

- Rector Nominee for Sports activities of Gymkhana, IIT Kharagpur (Sep. 2017- Present).
- Program Officer (Caretaker), NCC, Air Wing (EAA), IIT Kharagpur (Aug. 2016 - Present).
- Program Officer, NSO (EAA), IIT Kharagpur (Jan. 2016- Aug. 2016).
- Induction Program Faculty member, IIT Kharagpur (July 2017).
- Special Election Observer, Gymkhana, IIT Kharagpur (July 2017, June 2016).
- Lab incharge for Digital Communication and Communication systems Lab., E&ECE, IIT Kharagpur (Apr. 2016 - Present).
- Faculty team member looking into security and smooth conduct of Spring fest 2016 and 2017.
- TPC member: COMSNETS, NCC, ICDCN, IFIP Networking
- Session chair: ICDCN 2018, IEEE WPMC 2017, COMSNETS 2015
- Reviewer (Journals): IEEE Commun. Letter, IEEE Trans. Mobile Computing, IEEE Trans. Broadcasting
- Reviewer (Conferences): IEEE WCNC 2014, IEEE GLOBECOM 2014
- Designated Reviewer: IEEE ANTS 2014
- Student volunteer: IEEE ANTS 2014, NCC 2013, IETE workshops: VLSI technology and recent trends in Electronics 2007, PLC and recent trends in Electronics 2006

## PROFESSIONAL AFFILIATION

- Member, IEEE, IEEE Communications Society, IEEE Computer Society

## PRESENTATIONS

- Invited talks: Politecnico di Torino, Italy (June. 2016); IEEE Signal Processing Society, IIT Kharagpur (Nov. 2015); IIIT Delhi (Sep., 2014); BITS Pilani (Sep., 2014); Dublin City University, Ireland (Sep., 2013).
- Conferences: ICDCN 2018, IEEE WPMC 2017, IEEE IWCMC 2016, IEEE WoWMoM 2015, IEEE ICC 2014, IEEE WoWMoM 2014, NCC 2014.

## STUDENTS

- Current Ph.D. research scholars: Pradip Kumar Barik (Jointly with Prof. Raja Datta), Kaushik Das (Jointly with Prof. Raja Datta), Swati Swayamsiddha (Jointly with Prof. Rajarshi Roy), Monalisa Ghosh (Jointly with Prof. P. K. Biswas).
- As Project guide:
  - Current M. Tech. (2017-2018): Vinayak Patil, Anshul Varma
  - Current Dual-degree (2016-2018): Raga Bharani Chenna, Dokku Muralidhar, Nikesh Wasnik
  - Current B.Tech. (2017-18): Sandeep Yerramsetty
  - Graduated M.Tech. (2016-2017): Sneha Tipugade, Ajay Sahu, Madhuri Peechugalla, Yamini Goyal
  - Graduated Dual-degree (2016-17): Goutham Teja Tadepalli
  - Graduated B.Tech. (2016-2017): Anshul Gupta, Mokshagna Krishna, G. Vignan Kumar
- DSC member of Ph.D scholars: Murala Laxmi Naresh Kumar, Jaiprakash Nagar, Gargi V Pillai,