

# Dr. Antti Tölli

Curriculum Vitae

25 November 2019

## PERSONAL DATA

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Name: <u>Antti-Heikki</u>	Home address: Kurkiojantie 19, 90650 Oulu, Finland
Surname: Tölli	
Gender: Male	Work address: Centre for Wireless Comm., P.O. Box 4500, 90014 University of Oulu, Finland
Marital status: Married	E-mail: <a href="mailto:antti.tolli@oulu.fi">antti.tolli@oulu.fi</a>
Nationality: Finnish	www-page: <a href="http://www.ee.oulu.fi/~atolli/">www.ee.oulu.fi/~atolli/</a>
Date of birth: 17 December 1974	Telephone: +358 44 5000 180
Place of birth: Oulu, Finland	

## EDUCATION, DEGREES AWARDED AND TRAINING

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<b>Title of Docent (Adjunct Professor)</b> <i>Centre for Wireless Communication (CWC), University of Oulu</i>	Jan 2013 Oulu, Finland
· Field: radio resource management in wireless networks	
<b>Doctor of Science in Technology</b> <i>University of Oulu</i>	June 2008 Oulu, Finland
· Major: telecommunications, minor: digital signal processing	
· Title: "Resource Management in Cooperative MIMO-OFDM Cellular Systems"	
<b>Master of Science in Engineering</b> <i>University of Oulu</i>	Mar 2000 Oulu, Finland
· Major: telecommunications, minors: electronics and signal processing.	
· "Comparison of Different Uplink Antenna Configurations in WCDMA Base Stations" (Excellent)	
· <i>MSc student</i> at University of Oulu, Dept of EE, Finland	Sept 1994 – Mar 2000
<b>Finnish Matriculation Examination</b> <i>Ruukin lukio</i>	June 1993 Ruukki, Finland
· Upper secondary school, Sept 1990 – May 1993	
<i>University studies abroad</i> University of Idaho, USA, Studies in wireless communications and electronics	Aug 1997 – May 1998
<i>Military service</i> , Reserve officer (Second Lieutenant) Jääkäriprikaati, Anti-tank Company, Sodankylä, Lapland, Finland,	June 1993 – May 1994

## KNOWLEDGE OF LANGUAGES

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Finnish: mother tongue, English: fluent, Spanish: fluent, French: intermediate, Swedish: intermediate, German: basic

## PRESENT PROFESSIONAL POSITION

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<b>Associate Professor</b> <i>Centre for Wireless Communication (CWC), University of Oulu</i>	June 2018 – Oulu, Finland
· Focus area: Design and optimization of heterogeneous wireless access networks	

## PREVIOUS PROFESSIONAL POSITIONS

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<b>Academy of Finland Research Fellow (Akatemiatutkija)</b> <i>Centre for Wireless Communication (CWC), University of Oulu</i>	Sept 2014 – Oct 2019 Oulu, Finland
· Tasks: fundamental research, acquisition of research funding, supervision of doctoral and M.Sc. students, teaching of graduate and postgraduate courses	
<b>Visiting Scholar</b> <i>University of California Santa Barbara</i>	Aug 2018 – June 2019 Santa Barbara, CA, USA
· Research visit hosted by Prof. Upamanyu Madhow and funded by the Academy of Finland.	
<b>Visiting Scholar</b> <i>EURECOM</i>	Oct 2015 – June 2016 Sophia Antipolis, France

- Research visit hosted by Prof. David Gesbert and funded by the Academy of Finland.

**Senior Research Fellow (Yliopistotutkija)**

Nov 2009 – Aug 2014  
Oulu, Finland

*CWC, University of Oulu*

- Tasks: fundamental research, acquisition of research funding, supervision of doctoral and M.Sc. students, teaching of graduate and postgraduate courses

**Project Manager**

Jan 2008 - Oct 2009  
Oulu, Finland

*CWC, University of Oulu*

- Main responsibility was to lead CWC's research activities in the large European research project CELTIC WINNER+ "Wireless world INitiative NEw Radio".
- Task Leader in Advanced Antenna Schemes task in WINNER+
- Main research interests: System level issues in beyond 3G systems. Radio resource management (RRM) research with special focus on resource allocation for adaptive multi-user MIMO-OFDM cellular systems.

**Research Scientist**

Aug 2003 - Dec 2007  
Oulu, Finland

*CWC, University of Oulu*

- Main research interests: RRM research with special focus on resource allocation for adaptive multi-user MIMO-OFDM cellular systems.

**Various positions at Nokia Networks**

May 1997 - June 2003

- *Research Project Manager* (Jul 2002 – June 2003) *Málaga, Spain*
- *Research Engineer* (Oct 2000 – June 2002) *Málaga, Spain*
- *Research Engineer* (Mar 2000 – Sept 2000) *Oulu, Finland*
- *MSc thesis worker* (Mar 1999 – Feb 2000) *Oulu, Finland*
- *Trainee* (May 1997 – 20.8.1997, Jul 1998 – Feb 1999) *Oulu, Finland*
- Duties related to project management, 3GPP standardisation, algorithm development, link and system level simulations and simulator modelling, and field measurements of radio network performance. In addition, experience related to system integration and analogue/digital circuit design.
- Main research interests: RRM algorithms for WCDMA/(E)GPRS systems including intra/inter-system traffic balancing, inter-system handover, packet scheduling, load estimation algorithms, multi-sensor transceivers, receiver algorithms and diversity schemes.

**Trainee**

June 1995 – May 1997  
Oulu, Finland

*Masera Electronics Oy*

- Part/full-time position in a contract manufacturing company. Responsible for development of production management and quality control programmes (database programming).

**GRANTED RESEARCH PROJECTS AND SCHOLARSHIPS**

**Industrial Funding**

- A. Tölli (Principal investigator,PI), "5G standards research on mm-wave access (5G STARA)", Nokia, March 2019

**European Union (EU)**

- A. Tölli (Principal investigator,PI), "5G Enhanced Mobile Broadband Access Networks in Crowded Environments (5G-Enhance)", EU call H2020-EUJ-2018, 372500€, nr. 815056, May 2018

**Academy of Finland**

- A. Tölli (PI), "CCCWEE: Coded Collaborative Caching for Wireless Energy Efficiency", Funding period 1.9.2018 - 31.08.2021, 349 880€, Nr. 319059 (18.06.2018). Joint project with Aalto Univ. (Olav Tirkkonen)
- A. Tölli (PI), "PRISMA: Positioning-aided Reliably-connected Industrial Systems with Mobile mmWave Access", Funding period 1.1.2018 - 31.12.2019, 150000€, Nr. 313041 (11.10.2017). Joint project with Tampere Univ. of Tech. (Simona Lohan)
- A. Tölli (PI), "WiFiUS: Millimeter Wave-based Wearable Networks in High-end IoT Applications", Apr 2017 – Dec 2019, 131 008€, Nr. 311741 (12.04.2017). Joint project with University of Texas at Austin, USA (Robert Heath) and Tampere University of Technology (Olga Galinina)

- A. Tölli (PI), "Innovation of Transmission Technologies towards 5G Networks", Feb 2015 – Dec 2017, 157 000€, Nr. 284727 (27.1.2015)
- A. Tölli (PI), "Distributed Multidimensional Signal Processing in Heterogenous Networks (additional funding)", Sept 2014 – Aug 2017, 210 000€, Nr. 284590 (12.6.2014)
- A. Tölli (PI), "Distributed Multidimensional Signal Processing in Heterogenous Networks (additional funding)", Sept 2017 – Aug 2019, 140 000 EUR, Decision Nr. 312648 (26.4.2017)
- A. Tölli (PI), "Distributed Multidimensional Signal Processing in Heterogenous Networks (Academy Research Fellow position)", Sept 2014 – Aug 2019, 434 485€, Nr. 279101 (16.5.2014)

#### **Finnish Funding Agency for Technology and Innovation (Tekes)**

- A. Tölli (PI), "Energy-Efficient Wireless Networks and Connectivity of Devices – Densification" (EWINE-D), May 2013 – Apr 2015, 254872€, Appl. No. 194/31/2013, Dec. No. 40140/13 (19.4.2013)
- A. Tölli (PI), "Interference Management for Wireless Networks Beyond Present Horizon+" (IMANET+), July 2011 – June 2013, 400000€, Appl. No. 547/31/2011, Decision No. 40178/11 (29.4.2011)
- A. Tölli (PI), "Interference Management for Wireless Networks Beyond Present Horizon" (IMANET), July 2010 – June 2011, 208435€, Appl. No. 673/31/2010, Dec. No. 40158/10 (6.5.2010)

### **STUDENT SUPERVISION AND TEACHING**

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#### **Supervision of Doctoral students**

- D.Sc. Petri Komulainen, "Coordinated multi-antenna techniques for cellular networks : Pilot signaling and decentralized optimization in TDD mode", (Nov 2013, co-supervised with Prof. M. Juntti)
- D.Sc. Xiaojia Lu, "Resource allocation in uplink coordinated multicell MIMO-OFDM systems with 3D channel models" (Dec 2013, co-supervised with Prof. M. Juntti)
- D.Sc. Valtteri Tervo, "Joint multiuser power allocation and iterative multi-antenna receiver design" (May 2015, co-supervisors Profs. T. Matsumoto, M. Juntti)
- D.Sc. Harri Pennanen, "Coordinated beamforming in cellular and cognitive radio networks" (Sept 2015, co-supervised with M. Latva-aho)
- D.Sc. Jarkko Kaleva, "Decentralized Multiantenna Transceiver Optimization for Heterogeneous Networks" (June 2018, co-supervisor Prof. M. Juntti)
- D.Sc. Ganesh Venkatraman, "Traffic aware resource allocation for multi-antenna OFDM systems" (Sept 2018, co-supervised with Prof. M. Juntti)
- Currently supervising 5 doctoral students: M.Sc. Hossein Asgharimoghaddam, M.Sc. Praneeth Jayasinghe, M.Sc. Antti Arvola, M.Sc. Dileep Kumar, M.Sc. Ayswarya Padmanabhan, M.Sc. Hamidreza Bakhshzad Mahmoodi, M.Sc. Bikshapathi Gouda

Supervisor or examiner for about 20 master's theses.

#### **Teaching**

- Teaching of master-level course "521317S Wireless Communications II", Spring 2013-
- Teaching of post graduate course "Multiuser Communications in Wireless Networks", 9 credit units, Fall 2011
- Various tutorials and invited talks in international conferences

### **RESEARCH VISITS**

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- Visiting scholar at University of California, USA hosted by Prof. U. Madhow, Aug 2018 – Jun 2019
- Visiting scholar at EURECOM Institut, France hosted by Prof. D. Gesbert, Oct 2015 – Jun 2016
- Research visit at Japan Advanced Institute of Science and Technology (JAIST) invited by Prof. Tadashi Matsumoto, Feb – Mar 2010

### **SCIENTIFIC ACTIVITY**

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#### **External evaluations**

- Ranked 1st from in total 28 applicants for University of Oulu's Tenure track Associate Professor position in Wireless Communications, April 2018

- Ranked 2nd best candidate from in total 40 applicants for Tampere University of Technology's Tenure track position in Communications Engineering, April 2015
- Ranked among 9 best candidates selected for the 2nd round evaluation from in total 104 applicants for Aalto University's Tenure track position in Communications Engineering and Networking Technology, group 3, December 2012
- Evaluation for the Title of Docent, Fall 2012

### **Publications, citations and h-index**

- Total number of publications  $\geq 200$ : 38 published/accepted journal publications (34 IEEE, 3 Eurasp), 4 IEEE journal submissions in review process, 15 patents, 4 book chapters
- Google Scholar: total number of citations: 3282, h-index: 30 (25 November 2019), public link: <http://scholar.google.com/citations?user=qwWSqawAAAAJ>

### **Duties in scientific meetings**

- Special Session Co-Chair of IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC) 2019, Cannes, France, July 2019
- General co-chair of Workshop on Novel Medium Access and Resource Allocation for 5G Networks held in conjunction with IEEE ICC 2016, Kuala Lumpur, Malesia, June 2016
- General co-chair of International Workshop on Wireless Distributed Networks (WDN2011) held in conjunction with IEEE PIMRC2011, Toronto, Canada, Sep 2011 (<http://www.icwdn.org/>)
- Finance Chair of IEEE Communications Theory Workshop (CTW2011), Sitges, Catalonia, Spain, June 2011
- General co-chair of International Workshop on Wireless Distributed Networks (WDN2010) held in conjunction with IEEE PIMRC2010, Istanbul, Turkey, Sep 2010
- TPC member of various conferences including IEEE ICC, Globecom, WCNC, PIMRC, SPAWC, VTC Spring/Fall

### **External thesis reviews, opponent in doctoral/licentiate defense and thesis committee service**

- Opponent or Committee member (Doctoral defense): Anver Hisham, Chalmers Technical University, Sweden, Nov 2019, Ole Grøndalen, NTNU, Norway, Sept 2019, Eleftherios Lampiris, EURECOM, France, Aug 2019; Sven Jacobsson, Chalmers Technical University, Sweden, Aug 2019; Christopher Mollen, Linköping University, Sweden, April 2018; Petteri Kela , Aalto University, June 2017; Jhanak Parajuli , Jacobs University, Germany, September 2016; Gerardo Gomez, Universidad de Málaga, Spain, June 2009
- Pre-examiner: Furqan Ahmed, Aalto University, March 2016; Ömer Bulakci, Aalto University, Finland, March 2013 Helka-Liina Määttänen, Aalto University, Finland, September 2011
- Member of international review team for EU funded FET Project 265578 – HIATUS, 2012-2014

### **Editorial Board memberships**

- Associate Editor, IEEE Transactions on Signal Processing, 2017-

### **Membership in scientific societies**

- Senior member of IEEE, member of IEEE Communication, Information Theory and Signal Processing Societies