Ted Johansson, CURRICULUM VITAE
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Name	Ted Johansson
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In short:

Education: Docent Integrated Circuits and Systems at LiU 2015.
Ph.D. Electronic Devices at LiU, 1998 (industrial Ph.D. student).
M.Sc. EE and Applied Physics (Y-linjen) at LiU, 1985.
Part of the M.Sc. studies at RWTH, Germany.

Profile: Associate Professor in Analog Circuit Design at Uppsala University (UU), Sweden in the areas of circuit design. Design of neural-network of efficient processing of detected signals. Wireless high-speed intrabody communication for healthcare applications.
Teaching of basic courses in the Engineering Physics master program (F), and Electrical Engineering master program (E) and bachelor program (El)
Teaching PhD courses in Solid-State Electronics (TCAD simulations, analog circuit design).

Industrial R&D of radio technologies for wireless communication, through own consultant company ”dBm RF Research AB” (since 2008), and before that Infineon and Ericsson:
- CMOS PA design for different wireless communication standards
- RFIC design of circuit blocks for cellular communications systems
- Radio architectures (RF) for cellular basestations
- New circuit technologies, vendor contacts
- Concept and long-term strategy planning in the above areas
- Competitor analysis, including circuit reverse engineering

I am Associate Professor/Senior Lecturer in Analog Circuit Design at Uppsala University, Sweden, in the Solid-State Electronics group at the Department of Electrical Engineering. The group do research in sensors and intra-body communication for medical applications, CMOS quantum computing, energy harvesting, and neuromorphic devices. I started in March 2021 as a part-time researcher and from 2024-01-01 I am full-time Associate Professor.
I have taught many courses at international master level programs at LiU, but at UU am I teaching Introductory Course to master program in Engineering Physics (1st year), and Project in Electronics for the bachelor and master programs (2nd year) in Electrical Engineering, since I can teach in Swedish! I also teach PhD courses in our division, most notably the 2024 "CMOS Analog Chip Design".

Before that, I served as Adjunct Professor at the Integrated Circuits and Systems group at Linköping University with research projects, PhD and master thesis supervision, and teaching for the maximum allowed time of 12 years for that position. The research work focused on integrated PA design (CMOS), ultra low-noise LNAs, low-power radio design, and future radio circuit architectures (SDR), all areas with focus on cellular communication.

In Dec 2015, I became Docent (the highest education grade in the Swedish academic system, sometimes translated as Associate Professor, to map on systems in many other countries) in order to be Main Supervisor for Ph.D. students.

Since 2008, I have also been working through my own company dBm RF Research AB.

During 2008-2011, I was a full-time consultant with Huawei Technologies Sweden AB, Kista: RF-ASIC design for macro basestations, future circuit technologies, future basestation RF architectures (macro to femto), and RF-MEMS for basestations.

Until late 2007, I was with Infineon Technologies Sweden AB, Kista, working on CMOS concept and circuit design for cordless phones, reverse engineering of mobile phone circuits, and EU-related R&D projects, and before that (-2002) Ericsson Microelectronics working on various semiconductor technologies for mobile communications (process and device development).

Over the years, I have been doing BiCMOS and CMOS design work in the following nodes and suppliers: 28 nm bulk (TSMC), 28 nm SOI (STM), 65nm (GF, IFX, STM), 0.13um (IFX), 0.18 um (IBM), 0.25um (Ericsson MIC), 0.35 um (IBM, AMS), 0.5um (Ericsson MIC).

PROFESSIONAL & ACADEMIC BACKGROUND

- Associate Professor, Solid-State Electronics group, Uppsala University, 2024 -
- Senior Engineer, consultant (full-time 2008-2011, part time now).

- Researcher, Solid-State Electronics group, Uppsala University, 2021 - 2023
- Adjunct professor + research + teaching, Integrated Circuits and Systems group (formerly Electronic Devices), Linköping University, 2009 - 2021.
- I also held various specialist (Expert/Principal) and project management positions within microelectronics and telecom industry R&D.
- Concept and design of circuits for cellular basestations.
- New radio architectures for cellular basestations.
- Design of Integrated Power Amplifiers in various bipolar and CMOS technologies for wireless communication standards between 700 and 2800 MHz.
- Development of several IC and discrete technologies for telecommunication purposes, especially RF-power bipolar and LDMOS technologies, and RF-BiCMOS.
- Participation and part-management of funded R&D projects on SiGe and SiGe:C RF-bipolar technologies, CMOS-SOI, including RF-BiCMOS on SOI, and high-frequency modules.

- Many evaluations, committees, and review work in the academic society and for the European Commission.

- Author and coauthor of more than 70 journal and conference peer-reviewed papers. Also numerous texts in magazines and applications notes. Author of chapter about SiGe transistors in book.
- Holder of 40 patents. Finalist 2004 and 2005, Infineon Inventors Award for "Broadest Portfolio".

Professional experience

2021- **Uppsala University,** Sweden, Department of Electrical Engineering, Division of Solid-State Electronics.
Researcher (2021), Associate Professor (2024-): Sensor design and neuromorphic circuits for medical applications (brain-human interfaces). Intra-body communication.

2016-2018 Work in Vinnova-funded project (partners: Catena Wireless Electronics AB, Sweden Connectivity AB, Linköping University) regarding a new PA architecture for increased efficiency for WLAN.

2015- Teaching (in addition to Adj Prof) at Linköping University
- undergraduate course in Radio Electronics (TSEK02), RFIC design (TSEK03), Transceiver Design (TSEK38), VSLI design (TSEK06)
- graduate courses

2011-2012 Work in Vinnova-funded project (partners: Uppsala University, Nanoradio, Samsung AB, ComHeat AB) regarding use of EDMOS device in 65 nm foundry CMOS. Design of test structures, PA demonstrators for WLAN and cellular, PA measurements, modeling.

2009- **Owner, consulting company "dBm RF Research AB"** (www.dbmrf.se)

2009-2021 **Linköping University**, Sweden, Department of Electrical Engineering, Division of Integrated Circuits and Systems (formerly Electronic Devices).
Adjunct Professor: Integrated Power Amplifier Design, LNA, low-power radio design, future integrated radio architectures.

2008-2011 **Huawei Technologies Sweden AB,** Senior research engineer (consultant), RF-ASIC and IRF Radio groups.

- Concept and design of integrated power amplifier for various telecom applications in basestations and terminals for 3G and 4G applications.
- R&D on Low-Noise Amplifiers for basestations in silicon technologies.
- R&D on RF radio architecture for future integrated basestation circuits.
- RF and IF component technologies for basestations, also including filters and RF-MEMS.
- Long-term strategy work in the fields above, including university cooperation work.

2005-09 **Owner, consulting company "Ted Johansson Halvledarkonsult"** (enskild firma)

2002-07 **Infineon Technologies Nordic AB**
2002-2004: *Principal* position in Fore-Front Innovations and

Concept Engineering groups.

- Technology Strategist, RF-bipolar, RF-BiCMOS and RF-CMOS technology.
- Reverse Engineering and Process Assessments.
- Participation and part-management of funded EU project CMOS-SOI, including RF-BiCMOS on SOI, RF passives etc.
- Process adaptations of LDMOS-IC and smart-power processes to 0.25 um BiCMOS fabrication line.

2005- : *Senior Concept Engineer*

- Concept and Design of integrated CMOS power amplifiers for business area Connectivity (cordless/DECT, WLAN, Bluetooth etc.): 0.13 um CMOS amplifier (class AB) for DECT, 65 nm WLAN-PA (class AB), 130 nm switched PA for ISM and DECT (class E).
- Participation in EU Medea+ funded project HIMISSION, headed by Ericsson AB. PA design with Chalmers Technical University, and CMOS process foundry services for the project.
- Reverse Engineering, Process Assessments, Cost Engineering.

1999– 2002 **Ericsson Microelectronics AB**

Expert position at RF-IC Product Line.

- Development of 0.25 um RF-BiCMOS platform.
- Development of integrated PAs for DECT and GSM.
- Participation in and part-management of funded EU projects on SiGe and SiGe:C RF-bipolar technology

1995 - 1998 **Ericsson Components AB**

Process engineer and project leader for process and product development at RF-Power Product Line.

- Development of bipolar RF-power technologies.
- Participation in and part-management of funded EU projects on SiGe technology for RF-power.

1989 – 1995 **Ericsson Components AB**

Process engineer and project leader for process and product development, Process and Device Technology Group.

- Development of bipolar RF-power technologies for base stations.
- Development of low-voltage MOS RF power transistors for handheld applications.

(NB. All Ericsson and Infineon employments were at the same location – name, owner, and focus of the company changed.)

1985 - 1989 **Swedish Institute of Microwave Technology/ Microelectronics**

Research Engineer. Applied research in the areas of silicon MOS processing and devices.

1981-1982 **National Defense Research Institute** ("FOA3", Linköping, now FOI).

12 months internship at a department that studied radiation

effects on semiconductors.

Degrees

2015	Docent, University of Linköping, Sweden.
1998	Ph.D., Electronic Devices, Department of Physics and Measurement Technology, University of Linköping, Sweden.
1993	Licentiate of Engineering, Electronic Devices, Department of Physics and Measurement Technology, University of Linköping, Sweden.
1985	Master of Science, Applied Physics and Electric Engineering, University of Linköping, Sweden. (1983-84: part of studies and Master Thesis at RWTH, Aachen, Germany.)

Funding grants

- Vinnova, "Effektförstärkare för WLAN och nya komponenter för power management i 28/22 nm CMOS", 2013, 3.8 MSEK, main applicant.
- Vinnova, "Integrerade WLAN-effektförstärkare i 28 nm bulk och FD-SOI CMOS", 2015, 480 kSEK, main applicant.
- Vinnova, "Integrerad WLAN-effektförstärkare med hög verkningsgrad och hög linjaritet i 28 nm CMOS", 2016, 4 MSEK, main applicant.
- MIRAI (through Vinnova), "Neuromorphic circuits on flexible substrates for electronic skin", 2022, 150 kSEK, main applicant.
- SSF, "BOS: Software Principles & Techniques for a Body-centric OS", 2022, 34.9 MSEK, co-applicant.

Supervised and advised doctoral dissertations and other academic theses

- Ph.D. thesis supervisor at LiU:
    - M. F. U. Haque (with Prof. Dake Liu): co supervisor 2013-2015, main supervisor 2015-2017, dissertation 2017-02-23.
    - M. T. Pasha (with Prof. Mark Vesterbacka), co supervisor 2014-2015, main supervisor 2016-2019, dissertation 2019-01-31
    - O. Morales (with Prof. J Jacob Wikner): co-supervisor 2016 - 2022, dissertation 2022-10-12.
    - J. B. Asli (with Prof. Atila Alvandpour): co-supervisor, 2019 - 2021,

still in studies.
    - Johan Engstrand (with Assoc. Prof. Robin Augustine): co-supervisor, 2024-

- Ph.D. review committee:
  Juan Cardenas, KTH (1998)
  Julius Hållstedt, KTH (2007)
  Liang Rong, KTH (2013)
  Mustafa Özen, CTH (2014)
  Klas Eriksson, CTH (2015)
  Yu Yan, CTH (2015)
  Maryam Olyaei, KTH (2015)
  Tobias Tired, LTH (2016)
  Sebastian Gustafsson, CTH (2018)
  Muhammed Shakir, KTH (2019)
  Jonas Lindstrand, LTH (2019)
  Konstantinos Garidis, KTH (2020)
  Anders Jakobsson, LiU (2022)
  Iman Ghotbi, LU (2023)
  Husileng Bao, CTH (2024)

- Ph.D. thesis international expert reviewer:
  Arshad, NED University of Engineering & Technology, Pakistan, 2017.
  Saleem, Aalto University, Finland, 2021.

- Supported and co-mentored several Ph.D. students, resulting in common publications, at KTH, LiU, UU, CTH, HiG (all Sweden), and CIS, Stanford University (USA).

- Supervisor and/or examiner of at least 35 Master Thesis students connected to LiU, KTH, UU and HiG.

Scientific expert positions

- Peer reviewer for Journals:
    - Bentham Science Recent advances in Electrical and Electronics Engineering
    - Elsevier Microelectronics Reliability (MR)
    - Elsevier Microprocessors and Microsystems
    - IEEE Electron Device Letters (EDL)
    - IEEE Microwave and Wireless Components Letters (MWCL)
    - IEEE Open Journal of Circuits and Systems (OJCAS)
    - IEEE Transactions on Circuits and Systems (TCAS-I)
    - IEEE Transactions on Circuits and Systems (TCAS-II)
    - IEEE Transactions on Microwave Theory and Techniques (TMTT)
    - IEEE Sensors Journal (JSEN)
    - IEEE Sensors Letters (LSEN)
    - IET Circuits, Devices and Systems (CDS)
    - Springer Analog Integrated Circuits & Signal Processing (ALOG)
    - Springer International Journal of Infrared, Millimeter, and Terahertz

Waves (IJIM)
    - Springer Journal of Electronic Testing (JETT)
    - Taylor & Francis International Journal of Electronics (IJE)

- Peer reviewer for Conferences:
    - NORCAS 2015, 2017-
    - ISCAS, 2018, 2022
    - IEEE Asia Pacific Conference on Circuits and Systems, 2019

- Technical Program Committee (TPC):
    - NorCAS 2019-

- Evaluator, Electric Engineering education in Sweden. Swedish National Agency for Higher Education (Högskoleverket, UK-ämbetet), (2012-2013).
- Evaluator, external expert research programs, Swedish Foundation for Strategic Research (SSF) (2014).
- Evaluator, external expert, Adjunct Professor, Halmstad University (2015).

- Evaluator, external expert of funding applications
    - Academy of Finland: 2012 (two different calls), 2019.
    - Austrian Science Fund (FWF), 2015.
    - Romania Agency for Higher Education, Research, Development, Funding, 2021.

- European Commission, evaluator, expert :
    - Space 2016 Funding call, 2016.
    - 5GPPP Funding calls, 2020 and 2021.
    - COREnect, Year 1+2 reviews, 2021-2022.
    - ThoR project, Final review, 2022.
    - Dragon project, Year 1 review, 2022.
    - HORIZON-JU-SNS-2023 Funding call, 2023.
    - EE CHIPS JU, project screening, 2024

- Organizing committee for national scientific conference SSoCC (2010-2015).

Invited talks

- IECC 2017 (Karachi, Pakistan), ”The 28 nm CMOS Power Amplifier”.
- 2018-02-27 (Karachi, Pakistan), ”Power-efficient CMOS power amplifiers”.
- INTERACT-2023 (Karachi, Pakistan), "Wireless Brain-Connect Interface to Machines".

Professional organizations

- IEEE Member 1990, Senior Member 1996.
        - Member EDS, SSC and MTTS societies.

- Vice chair Swedish IEEE EDS chapter 2000-2012.
- Chair Swedish IEEE SSCS/CAS joint chapter 2012-2014, vice chair 2015-

- Member SER (Svenska Elektro- och Dataingenjörers Riksförening) 2011-2018, board member 2015-2016.

R & D Administration

- 2005 – 2008 EU Medea+
  Infineon project leader for HIMISSION, headed by Ericsson AB.
- 1997 – 2001 Foundation for Strategic Research (SSF), Sweden.
  Coordinator for research program "HF-BIP" (Swedish universities).
- 2004- 2006 Infineon project leader for HIMISSION, headed by Ericsson AB.

- 2022 – Foundation for Strategic Research (SSF), Sweden.
  BOS project, Project administrator, UU

Miscellaneous

Languages: Swedish – native, English – perfect, German – good.

Excellent knowledge of RF-IC design tools Cadence (Virtuoso, Spectre, Assura, Calibre), ADS, GoldenGate and related tools for RF-IC circuit design and manufacturing.
Excellent knowledge of TCAD design tools (Synopses, Silvaco).
Excellent knowledge of programming of microcontrollers, such as Arduino.
Excellent knowledge on admin level for Linux systems and IC/MW design tools Cadence, ADS, and GoldenGate.

Good knowledge of RF system simulator SystemVue (Keysight) and EM simulator Momentum.
Good knowledge of FPGA design and tools (Intel/Altera and Xilinx).
Good knowledge of of MATLAB for technical computing.
Good knowledge of Python for hardware design (e.g. Raspberry Pi) and AI/ML.
Good knowledge of Open-Source Circuit design tools and flow for analog CMOS (xschem, magic, klayout, etc.)

Some knowledge of RF design tools Microwave Office (NI/AWR), and HFSS (Ansys).

I am generally very good with computers and fixing problems – Windows, Mac, and Linux.