

Ali Soltani Tehrani

Signal Processing Specialist

Year of birth: 1982

Contact

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Summary

Ali is a PhD from Chalmers with an expertise in the interdisciplinary field where communication systems, signal processing and hardware engineering intersect. He has worked with system level simulations of wireless transmitters and of MIMO wireless channels. His main expertise is on developing signal processing algorithms to compensate for impairments generated from imperfect hardware on the communication signal, techniques like digital predistortion, I/Q imbalance and phase noise compensation. He has also worked with developing hardware and software tools to improve power efficiency in RF transmitters. He has experience working with systemization and embedded systems, developing code for driver access to new hardware and code maintenance.

Specialities

Fields of Expertise

- Nonlinear system modeling
- System level simulation of transmitters and entire communication links
- Design and development of digital predistortion and I/Q imbalance compensation algorithms

Tools

- LaTeX
- Linux
- MS Office and Visio
- Eclipse
- ADS
- Lauterbach

Methods and techniques

- Analytical
- Structured and efficient
- Strong technical writing skills
- Familiar with both hardware and software techniques in wireless transmitters

Programming skills

- Matlab
- Simulink
- C
- Java
- IT++

Education

2000-2005	Bachelor of Science in Electrical Engineering	K.N.Toosi University of Tech
2005-2007	Master of Science Communication Systems	Chalmers University of Tech
2007-2012	PhD Communication Systems	Chalmers University of Tech

Employers

2013 – present	Qamcom Research & Technology AB
2007 – 2012	Chalmers University of Technology, GigaHertz Centre

Assignments

April 2014-current Signal Processing Expert, Qamcom Research and Technology

Involved in the systemization and software development of the 60 GHz microwave backhaul link-link project. The main tasks in this assignment were defining and testing of a hardware structure to be used in the product composing of the RF and baseband units, and developing and implementing software to access and use with the final product developed for Ericsson.

Oct. 2013- April 2014 Embedded Software Developer, Ericsson

Writing and developing code for driver and application layer access to hardware components in RAU software for Minilink radios and code maintenance. The main task in this assignment was writing and troubleshooting code for registry access (via SPI) to different hardware components (PLLs, ADCs, DACs, up and down converters, etc...). Code maintenance and debugging errors/trouble reports was also a focus of this assignment.

2013 Signal Processing Expert, Qamcom Research and Technology

Constructing phase noise for system level simulations of a MIMO communication link, and developing phase recovery algorithms at the receiver. The main task was to develop and implement suitable phase noise models in the transmitter (and receiver) oscillators, and using signal processing algorithms (like sparse sampling and extended Kalman filtering) to recover the phase.

2013 Signal Processing Expert, Qamcom Research and Technology

Geo-tracking and data mining for automotive platooning applications. The main tasks were to extract data from logs, synchronize, cross-validate and analyze the data (packet loss, hardware failure, etc) from the different vehicles, and to develop a particle filter with geological knowledge of the track.

2007 – 2012 Ph.D. researcher, Chalmers University of Technology – GigaHertz Centre

His PhD research dealt mainly with hardware–constrained communication. It focused on improving the performance of transmitters (mainly power amplifiers and modulators) in terms of both linearity and power efficiency utilizing digital signal processing techniques like digital predistortion (to compensate for PA and modulator hardware impairments) and iterative distortion cancelation (at the receiver). He has proposed and developed advanced DPD techniques for packet-based systems, fast adaptation techniques for DPDs, and has worked on computationally efficient DPD architectures. His tasks included implementation, development and debugging of algorithms (mainly in Matlab), system-level simulations, microwave device characterization with load-pull measurements, development of fully automated measurement test-beds and testing and evaluating the performance of the algorithms on state-of-the-art hardware (mainly RF power amplifiers and modulators). He has mainly worked with WCDMA, WiMAX, and LTE signals.

Publications

- 2014 A Bergenhem, C., Coelingh, E., Johansson, R., and A.Tehrani, "V2V Communication Quality: Measurements in a Cooperative Automotive Platooning Application", SAE Int. J. Passeng. Cars – Electron. Electr. Syst
- 2012 Soltani Tehrani, Ali, "Behavioral modeling of wireless transmitters for distortion mitigation", PhD thesis.
- 2012 Soltani Tehrani, Ali; Cao, Haiying; Eriksson, Thomas; Fager, Christian, "Modeling of long term memory effects in RF power amplifiers with dynamic parameters", Proceedings of the IEEE International Microwave Symposium (IMS).