389.233 Physically consistent modelling of wireless communication systems

New! Seminar Announcement for Winter Term 2023W

11-13 Oct. 2023 in Seminar Room 389-2 (Rm # CG0402) next dates during Nov. 2023 and Jan. 2024 t.b.a.

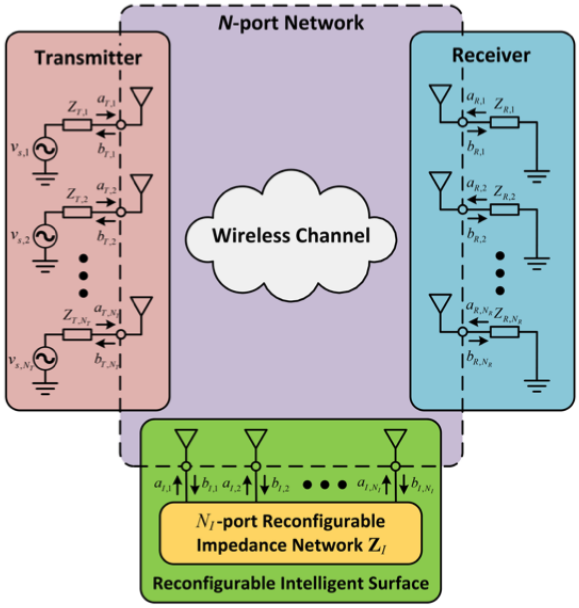

Fig. 1. System diagram of RIS aided wireless communication system.

This seminar is offered in the current winter term 2023W by guest professor Josef Nossek (TU München) jointly with Markus Rupp and Christoph Mecklenbräuker.

Firstly, basic methods for physically consistent modelling will be presented by the lecturer. Thereafter the students are to present a recent topic in this field.
It is the purpose of this seminar to discuss a framework that allows the correct assessment of the energy flow in a communication system and thereby enables an information theoretic analysis and optimization that is consistent with the underlying physics. With circuit theoretic channel models the potential performance of multi-antenna communication systems incorporating reconfigurable intelligent surfaces (RIS) will be analyzed and surprising results and insights will be revealed.

We will apply classical methods of circuit theory, and signal processing as well as the basics of electromagnetics and information theory.The overall connection of these different fields constitutes a basis for the correct description of energy flows in wireless communication systems

Semester hours: 2.0, Credits: 2.0, Type: SE Seminar, Format: Presence

Josef A. Nossek (S'72--M'74--SM'81--F'93—LF’12) received the Dipl.-Ing. and the Dr. techn. degrees in electrical engineering from the University of Technology in Vienna, Austria in 1974 and 1980, respectively. In 1974 he joined Siemens AG in Munich, Germany as a member of technical staff, in 1978 he became supervisor, and from 1980 on he was Head of Department. In 1987 he was promoted to be Head of all radio systems design. From 1989 to 2016 he has been Full Professor for circuit theory and signal processing at the Munich University of Technology (TUM) where he taught undergraduate and graduate courses on circuit and systems theory and signal processing and led research on signal processing algorithms for communications, especially multiantenna systems. He was President Elect, President and Past President of the IEEE Circuits and Systems Society in 2001, 2002 and 2003 respectively. He was Vicepresident of VDE (Verband der Elektrotechnik, Elektronik und Informationstechnik e.V.) 2005 and 2006, President of VDE 2007 and 2008 and was Vicepresident again in 2009 and 2010. His awards include the ITG Best Paper Award 1988, the Mannesmann Mobilfunk (now Vodafone) Innovationsaward 1998, the Award for Excellence in Teaching from the Bavarian Ministry for Science, Research and Art in 1998. From the IEEE Circuits and Systems Society he received the Golden Jubilee Medal for 'Outstanding Contributions to the Society' in 1999, the Education Award in 2008 and the Guillemin-Cauer Best Paper Award in 2011. In 2008 he also received the Order of Merit of the Federal Republic of Germany and in 2009 he has been elected member of the German National Academy of Engineering Sciences (acatech). In 2013 he received an Honorary Doctorate and in 2014 the Ring of Honor from VDE. From 2016 to 2019 he has been Full Professor at the Federal University of Ceara in Brasil. Since 2020 he is back at the TUM as an Emeritus of Excellence.