INSTITUT FÜR SIGNALVERARBEITUNG
UND SYSTEMTHEORIE
Prof. Dr.-Ing. Bin Yang
Pfaffenwaldring 47, D-70569 Stuttgart
Tel. 0711/685-67332 - Fax 0711/685-67311 - mail@ISS.uni-stuttgart.de

UNIVERSITÄT
STUTTGART

Matrix Computations in Signal Processing and Machine Learning

Dr.-Ing. Stefan Uhlich
Sony R&D, European Technology Center, Stuttgart

- **Contents:**
  - Basics and notation
    Vector/matrix norms, condition numbers, matrix derivatives, . . .
  - Useful matrix decompositions
    Eigen/singular value decomposition, nonneg. matrix factorization
  - Special matrices and their applications
    Toeplitz, Hankel, Vandermonde, Circulant

- **Applications that will be discussed in the lecture:**
  - Compressed Sensing
    "How can I efficiently sample and recover a sparse signal?"
  - Recommender systems
    "How does the book recommendation on Amazon work?"
  - PageRank algorithm
    "How does Google's search engine work?"
  - and many more where vector/matrix calculations play a fundamental role …

Time: Monday, 8:00 - 09:30 h, Start: October 12th, 2015

Examination: Oral examination, February/March 2016

Room: Pfaffenwaldring 47, Room 2.282 (ISS Seminar Room)

At least five students must participate in order that the lecture will be held.
Therefore, please, register via e-mail: mail@ISS.uni-stuttgart.de