Pattern and Speech Recognition
(aka: Speech Technology; Mustererkennung; Echtzeitdatenverarbeitung II)

Dietrich Klakow
Formalities

- Language
  - Default: English
Warning

This lecture contains some math, but …

it is mostly intense use of high school math
Formalities

• Lecture:
  • Tuesday 14:15-15:45
  • Location: seminar room in building C7 2
  • Contact:
    • D. Klakow: tel. 58122,
    dietrich.klakow@lsv.uni-saarland.de
Formalities

• Exercises:
  • Friday 14:15-15:45
  • Location: seminar room in building C7 2.
  • Tutors:
    Dr. Grzegorz Chrupala
gchrupala@lsv.uni-saarland.de
    Andrea Fischer
    s9aafisc@stud.uni-saarland.de

Time to be discussed, doodle it?
Prerequisites

Mathematics:
- Probability theory
- Some linear algebra and calculus

Programming
- Java
- C/C++
- ...

Formalities

• Exam:
  • Most likely a written exam
  • CuK, Mechatronik: 5 LP (for historical reasons)
  • LCT, LST, CS: 6 LP

• Note:
  • you are only allowed to participate in the exam if you are registered in HISPOS
  • monitor the deadlines yourself
1. Introduction
Literature

Pattern Recognition and Machine Learning
by Christopher M. Bishop
ISBN: 0387310738

• I plan to mainly use this book
Literature

Pattern Classification
by Richard O. Duda, Peter E. Hart, David G. Stork
Wiley-Interscience
ISBN: 0471056693

• A classic on pattern recognition
• Used for the centre part of the lecture
Literature

Automatische Spracherkennung
Ernst Günter Schukat-Talamazzini
Vieweg Verlag
ISBN 3-528-05492-1

• German!
• Only available via the internet (http://www.minet.uni-jena.de/www/fakultaet/schukat/asebuch.html)
Literature

Spoken Language Processing
by Xuedong Huang, Alex Acero, Hsiao-Wuen Hon,
Xuedong Huang, Hsiao-Wuen Hon
Prentice Hall
ISBN: 0130226165

• very comprehensive
Literature

**Applied Pattern Recognition**
von **Dietrich W. R. Paulus, Joachim Hornegger**
Vieweg
**ISBN:** 3528355581

- Speech and image analysis
- Software oriented
- Signal processing
Outline of the Lecture (last year)

1. Introduction
2. Basic Task of Pattern Recognition
3. Feature Extraction for Speech and Image Processing
4. Bayesian Decision Theory
5. Parameter Estimation
6. Nonparametric techniques
7. Gaussian Mixture Models and the EM-Algorithm
8. Speaker Recognition
9. Decision Trees
10. Neural Networks
11. Hidden Markov Models
12. Graphical Models and Conditional Random Fields
13. Acoustic Modeling
14. Language Models
15. Search
Is this what you expect?

• Content?
• Teaching style?

• Take yourself 5 minutes to write it down on a piece of paper
• Any Questions