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.
  • Tutor: Dr. Grzegorz Chrupala
gchrupala@lsv.uni-saarland.de

To be discussed
Prerequisites

Mathematics:
  • Probability theory
  • Some linear algebra and calculus

Programming
  • Java
  • C/C++
  • …
Formalities

- Exam:
  - Most likely an oral exam
  - Depends on number of participants
  - 30 minutes
  - Date and time: to be arranged
  - CuK, Mechatronik: 4.5 LP
  - LCT, LST, CS: 6 LP
1. Introduction
Pattern Recognition and Machine Learning
by Christopher M. Bishop
ISBN: 0387310738

• I plan to mainly use this book
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)
• The book I use most
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

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. Hidden Markov Models
11. Graphical Models and Conditional Random Fields
12. Acoustic Modeling
13. Language Models
14. Search
Is this what you expect?

- Content?
- Teaching style?

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