Communication Technologies 2 (CT2)

Machine Learning: Applications and Algorithms

Introduction

Michel Morold

Lecture in WS 2018 / 2019
01.11.2018

Contents

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- Organization
- Introduction
- Repetition of CT1 contents
- Topics for this lecture

Organization: About us

ComTec

- Prof. Klaus David
  - Dr. Immanuel König
  - M.Sc. Michel Morold
  - M.Sc. Judith Heinisch
  - M.Sc. Doan Ngoc Duong
  - M.Sc. Dennis Kroll
  - M.Sc. Christoph Anderson
  - M.Sc. Marek Bachmann
  - ComTec colleagues

- https://www.comtec.eecs.uni-kassel.de

About you

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- You
  - Name
  - Major
  - Previous major
  - Programming skills
  - …

Organization

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- Lecture
  - Presentation: 7 topics related to machine learning applications and algorithms
- Exercise (group work) / Lab Training (group work)
  - Scientific paper: 5 pages IEEE double column
  - Programming: task related to algorithms or data processing
- Exam (group work)
  - Presentation
  - Topics related to your paper

Important: Lecture Registration

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- A registration for this lecture is **mandatory** and done via HISPOS:
  - https://portal.uni-kassel.de/qisserver/rds?state=verpublish&status=init&vmfile=no&publishid=149775&moduleCall=webInfo&publishConfFile=webInfo&publishSubDir=veranstaltung
- **Start: 05.11.2018 08:00 - 16.11.2018 23:59**
- Max. number of students for this lecture: 20
- First come, first serve

Organization: Time plan

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Time	Lecturer	Topic
01.11.2018	MM	Introduction
01.11.2018	MM	Activity Recognition / Evaluation Metrics
05.11.2018-16.11.2018		**Deadline Lecture Registration**
08.11.2018	IK	Alignment for Context Prediction
15.11.2018	DK	Time Series II
22.11.2018	DD	WiFi Fingerprinting
TBA		**Deadline Exam Registration**
29.11.2018	MB	Multi Sensor Data Fusion
06.12.2018	CA	Dead Reckoning
13.12.2018	JH	Gaussian Mixture Models
14.12.2018 – 01.03.2019		Lab/Programming
20.12.2018		**Deadline submission time/work plan (for supervisor)**
02.03.2019		**Deadline of the draft paper and program**
22.03.2019	All	• **Presentations (12:00 – t.b.a.)** • **Deadline of presentation submission**
26.03.2019		**Deadline of the final paper**

Grade

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- Group work
- 2-4 Students
- Paper (and program, depending on specific task)
- Presentation
- Group grade (individual grades possible)
- **Important:** Create time schedule for your group work and mark individual workload of every group member in your paper (and code, if applicable) **-> submit time plan to your supervisor until 20.12.2018!)**

Grade: Bonus

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- Submit lecture summary (max. 2 slides) **via Moodle** or e-mail to **michel.morold@uni-kassel.de** until 11:59 p.m. of the day after the lecture (= Friday, 11:59 p.m.)
- Accepted Filetype: **.pptx (use template in Moodle!)**
- Naming convention:
  - **{LastName}_{MatriculationNumber}_Lecture_{No.}.pptx**
- Minimum 5 **reasonable** summaries
- Presentation (3-5 minutes) if selected at the beginning of the next lecture

Grade: Evaluation criteria

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Task	Criterion	Achieved	Not achieved
Paper (5 pages IEEE double column, use template in Moodle)	Technically comprehensive, clear structure	+/-	+/-
	Complete, content free from errors	+/-	+/-
	Shape and impression	+/-	+/-
	Grammar, expression, spelling	+/-	+/-
	Cite 3 (IEEE / ACM) publications related to own paper		-0.3/0.4
	Autonomy of the group	+/-	+/-
	PLAGIARISM		failed
Presentation (use template in Moodle)	Content, clear structure	+/-	+/-
	Rhetoric, language	+/-	+/-
	Talk time - 15-20 minutes per group (depending on group size)		-0.3/0.4
	Answering questions	+/-	+/-
	No presentation given		failed
Summaries (bonus)	Hand in at least **5 reasonable** summaries and present summary if selected at the beginning of the next lecture	+0.3/0.4	

Exam Registration

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- Exam Registration for Lecture
  - Informatik (HIS-POS)
    - Communication Technologies 2 **FB16-5350 (PNr 108011)**
  - ECE (OKA):
    - Communication Technologies 2 (**5350**)
    - Communication Technologies 2 - **Lab** (**5323**)
  - Deadline: **TBA**

- Moodle
  - Communication Technology 2
  - Web: https://moodle.uni-kassel.de/moodle/course/view.php?id=231
  - Password: **MM-18-CT2**

Problems

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- Registration
  - Alexander Bolz: alexander.bolz@comtec.eecs.uni-kassel.de
  - Michel Morold: michel.morold@uni-kassel.de
- Topic / task
  - Supervisor (e-mail)
- Appointment
  - Topic/task (mandatory)
  - Feedback of the paper task, preparation of the presentation task (mandatory), but maximum 4

Reminder: Topics of CT1

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- Context / Activity Recognition
- Features
- Time Series Segmentation
- Bayesian Classification
- Decision Trees / Random Forest
- K-nearest neighbor (KNN) / K-Means
- Support Vector Machines (SVM)

Topics for this lecture

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- Activity Recognition: Evaluation metrics (M.Sc. Michel Morold)
- Alignment Algorithm for Context Prediction (Dr. Immanuel König)
- Time Series Segmentation II (M.Sc. Dennis Kroll)
- WiFi Fingerprinting (M.Sc. Doan Ngoc Duong)
- Multi Sensor Data Fusion (M.Sc. Marek Bachmann)
- Dead Reckoning (M.Sc. Christoph Anderson)
- Gaussian Mixture Models (M.Sc. Judith Heinisch)