

**Modulbeschreibung**

# AI for sequential data analysis

**Allgemeine Informationen**

**Modulbezeichnung**

**AISeq**

**Modulkategorie**

Fachliche Vertiefung

**Modulverantwortliche/r**

**Mitra Purandare**

**Anzahl der Credits**

**3**

**Durchführungssetting**

<b>Campus</b>	<input type="checkbox"/> Buchs	<input checked="" type="checkbox"/> Rapperswil-Jona	<input type="checkbox"/> St. Gallen
<b>Online Teilnahme</b>	<input type="checkbox"/> keine Onlineteilnahme möglich	<input checked="" type="checkbox"/> hybrid	<input type="checkbox"/> ausschliesslich online
<b>Durchführung</b>	<input type="checkbox"/> wöchentlich	<input type="checkbox"/> als Blockwoche	<input checked="" type="checkbox"/> nach Absprache

**Ziele, Inhalt und Methoden**

**Lernziele, zu erwerbende Kompetenzen**

All participants are able to independently understand and explain scientific results in the field of sequential/time-series data analysis using statistical machine learning and/or deep neural networks.

In particular, all participants must be able to independently:

- Acquire, read, and understand scientific literature on a chosen topic.
- Write a scientific article expressing their understanding of this topic.
- Present and discuss this topic to the other participants of this seminar.
- Positively contribute to a scientific discussion on the topics chosen for the seminar.

Although the topics chosen for this seminar are specific to its chosen field, participants must be able to apply the same research and presentation skills in other areas of science and engineering.

**Modulinhalt**

Sequential data is everywhere – even the text written in this document is an example of sequence data. Some of the well-known applications of sequential data analysis are sentiment analysis, human activity prediction, speech processing, natural language processing, weather forecasting, and demand forecasting.

Sequential data analysis is a very dynamic field. Starting with the recurrent neural networks (RNNs), the field has progressed rapidly to Long Short Term Memory (LSTMs), Attention mechanisms to more recent transformer networks.

### Lehr- und Lernmethoden

Each participant is assigned a supervisor and a relevant topic of interest at the start of the seminar.

This is followed by an independent literature search and study of the assigned topic by the participant.

At the end of the seminar, each participant is expected to be able to express his understanding of the chosen topic to his peers in the form of a scientific paper and a scientific presentation. Additionally, each participant is expected to be able to positively contribute to a scientific discussion on the topics chosen for the seminar.

The execution of the seminar is organised around the following milestones:

- M0: Kick-off and topic selection
- M1: Submission of outline of article
- M2: Submission of first version of article
- M3: Submission of final version of article and first version of presentation
- M4: Presentation and discussion

The supervisor meets with the participant at or after each milestone in order to review and give feedback on the participant's progress. Only participants with an adequate first version of their article will be allowed to continue with the seminar and present.

### Voraussetzung, Vorkenntnisse und Eingangskompetenzen

- The ability and interest in sequential data analysis, machine learning, artificial intelligence in general is an essential prerequisite for this seminar.
- Since almost all existing literature on this topic is in English, the seminar will be held in English. The ability to understand texts in English is therefore a prerequisite for this seminar.
- Interest and prior knowledge in related fields such as deep neural networks, machine learning is recommended.

### Unterlagen

The topics for each execution of this seminar will be chosen at its start, depending on current developments in the field and the interests of each participant. Examples of relevant topics can be found within:

- <https://proceedings.neurips.cc>
- ICML: <https://dblp.org/db/conf/icml/index.html>
- Further list of conferences and journals: [DeepAI](#)

### Leistungsbewertung

#### Zulassungsvoraussetzung

A scientific article and presentation slides reviewed by the supervisor to be of adequate quality.

#### Prüfungsart

Oral Exam

#### Prüfungsdauer

30 min. Presentation & Discussion

#### Leistungsbewertung

The grade for this seminar will consist of an evaluation of the following aspects by the supervisor:

- Preparation & execution (planning, research)
- Article (content, structure, language)
- Presentation (content, structure, language, style, quality of answers)
- Participation in discussion (active participation, positive contribution to discussion, reflection w.r.t. chosen topic)