NLP for Intelligent Computer-Assisted Language Learning

Last update: December 23, 2018

Abstract:

Intelligent Computer-Assisted Language Learning (ICALL) is a relatively young field of interdisciplinary research exploring the integration of natural language processing in foreign language teaching and learning. The course will introduce conceptual issues and practical system development aspects of ICALL and provide the student with an overview of current research issues. Key questions discussed include the following: Where is the automatic analysis of language relevant for foreign language teaching and learning? What conceptual and practical issues are involved in natural language processing (NLP) of learner language, and what is the current state of the art in detecting errors and providing feedback to learners? How can NLP-supported research on learner corpora inform Second Language Acquisition (SLA) research? What are task and learner models and what roles do they play in ICALL systems? Where is the automatic analysis of native language relevant for foreign language learners and how can it be turned into innovative applications of real-life relevance?

Instructor: Detmar Meurers

- *Office:* Room 1.28, Blochbau (Wilhelmstr. 19)
- *Email:* dm@sfs.uni-tuebingen.de
- *Office hours:* Wednesdays 10:00–12:00 (arrange a slot by email beforehand)

Course meets:

- Wednesdays, 8:30-10:00, in Blochbau (Wilhelmstr. 19), Hörsaal 0.02
- Fridays, 8:30-10:00, in Blochbau (Wilhelmstr. 19), Hörsaal 0.02

Credit Points: 6 CP or 9 CP (with term paper)

- active participation in class: 4SWS * 15 = 60h (2 CP)
    - A prerequisite of active participation is being present in class! Missing more than two classes without real excuses automatically results in failing the class.
- reading and positing of questions: 60h (2 CP)
    - Note: Posting meaningful questions to the forum **before** the class discussing the topic is a crucial component of the seminar. Doing so for less than 60% of the topics automatically means failing the class.
- preparing and holding class presentation: 60h (2 CP)
- optional: term paper 90h (3 CP)

Syllabus (this file):

- html-Version (http://purl.org/dm/18/ws/hs)
- pdf-Version (http://purl.org/dm/18/ws/hs/syllabus.pdf)

Moodle page:

- `https://moodle02.zdv.uni-tuebingen.de/course/view.php?id=2622`

Nature of course and our expectations: This is a research-oriented Hauptseminar, in which we jointly explore perspectives and approaches on complexity in linguistics, psycholinguistics, and computational linguistics. You are expected to

1. regularly and actively participate in class, read the papers assigned by any of the presenters and post a meaningful question on Moodle to the "Reading Discussion Forum" on each reading *at the latest on the day before it is discussed* in class.

2. explore and present a topic:

   - select one of the sub-topics by the end of November
   - thoroughly research the topic, taking our literature pointers *as a starting point*
   - prepare the presentation with slides, send them to me by email and discuss them with me in a half hour slot during my office hour *at least a week before the presentation*
   - start a new Moodle thread on the "Reading Discussion Forum" specifying what every course participant should read to prepare for your presentation *a week before your presentation*
   - present and discuss the topic in class

3. if you pursue the 9 CP option, work out a project term paper

   - select a topic and submit a one-page abstract *by February 1, 2018* (and a revised version by February 15, 2018)
     - Note for Computational Linguistics students: The term paper must be produced in LaTeX using the ACL conference format or the Computational Linguistics journal format; BibTeX must be used for the bibliography.

Academic conduct and misconduct: Research is driven by discussion and free exchange of ideas, motivations, and perspectives. So you are encouraged to work in groups, discuss, and exchange ideas. At the same time, the foundation of the free exchange of ideas is that everyone is open about where they obtained which information. Concretely, this means you are expected to always make explicit when you've worked on something as a team – and keep in mind that being part of a team always means sharing the work.

For text you write, you always have to provide explicit references for any ideas or passages you reuse from somewhere else. Note that this includes text "found" on the web, where you should cite the url of the web site in case no more official publication is available.

Class etiquette: Please do not read or work on materials for other classes in our seminar. All portable electronic devices such as cell phones and laptops should be switched off for the entire length of the flight, oops, class.

Scheduling

- Wednesday, December 5: Detmar: Input enhancement (Meurers et al. 2010)

- Friday, December 7: Tim, Daniel, Miriam, Maxim: spell checking and normalization

- Wednesday, December 12: Detmar Meurers on Input enrichment (Chinkina and Meurers 2016)

- Friday, December 14: Grammar Error Detection and Correction

  - Anna-Sophie Bartle, Daniela Rossmann, Samantha Link: (Leacock et al. 2014, ch. 9) and approaches from the CoNLL Shared Task in Grammatical Error Correction 2014 (Ng et al. 2014) and current papers on GEC (e.g., Lichtarge et al. 2018)

- Wednesday, December 19: Dialogue Systems

  - Kai Hartung: (Petersen 2010)
  - Theresa Bertele: (Wilske 2015)
  - Jakob Hampel (Sagae et al. 2010)

- Friday, December 21: Classic Tutoring Systems

  - Jay Kejriwal, Chindu Bhadran, Cristina Papadopoulos: AutoTutor (Graesser et al. 2005; Nye et al. 2014; D'Mello and Graesser 2012)

- Wednesday, January 9:

  - Azeez Olaegbe: iStart, Writing Pal (Johnson et al. 2017)
  - Robot-based language tutoring
    * Mohamed Ouji (Vogt et al. 2017)
    * Teslin Roys (Schodde et al. 2017)

- Friday, January 11: Approaches to spoken language

  - Raja Irandoost: (Pennington and Rogerson-Revell 2019)
  - Nazanin Khazee-Farid: (D'mello et al. 2011)
  - Jana Murasová: ITSSPOKE (Litman and Silliman 2004)

- Wednesday, January 16: Approaches based on analyzing native language (Exercise generation, Input Selection/Enrichment/Enhancement)

  - Mareile Winkler (Huang et al. 2014)
  - Sophia Zube (Madnani et al. 2016)
  - Jerry Roys (Wang et al. 2009)
  - Nora Kumpikova (Walmsley 2015)

- Friday, January 18:

  - Julia Dobcyanska (Reynolds et al. 2014)
  - Eva Huber (Chen and Meurers 2017, 2019)
  - Zahra Solgi: Reliability of Automatic Analysis (Polio and Yoon 2018)

- Wednesday, January 23: Learning Analytics und NLP, Learner modeling (systems)

  - Sarah Taylor: (McNamara et al. 2017)
  - Le Duyen Sandra Vu: analyzing ITS data (Johnson et al. 2010)
  - Learner models
    * Elizabeth Bear: (Xu and Bull 2010)
    * Iuliia Kocharina: (Bull and Kay 2010)

- Friday, January 25: ICALL tools and their Evaluation

  - Isabell Gospodarczyk: (de Vries et al. 2015, 2016)
  - Fiona Quast: (Ferreira et al. 2007)
  - Marta Berardi: (Pujolà 2001)
  - Andreas Daul; (Caws and Heift 2016)

- Wednesday, January 30:

  - Svea Klaus: (Heift 2001; Hegelheimer and Heift 2017)
  - Denise Löfflad: current intervention study (Choi 2016)
  - Tanja Koch: meta-study (Golonka et al. 2014)

- Friday, February 1:

  - Sophie Hornuff, Marta Kifleab: motivational aspects (Bodnar et al. 2016, 2017)
  - Živilė Rasimaitė: Effectiveness of DuoLingo (Crowther et al. 2017)
  - Mihai Manolescu: Forgetting in Rosetta Stone (Ridgeway et al. 2016)

- Wednesday, Febraury 6: Specification and Discussion of Software Development Efforts

  - Haemanth Santhi Ponnusamy, Himanshu Bansal

References

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