

11-731 Machine Translation

Language Technologies Institute (LTI)

Spring Semester 2007

11-731: 12 Units

Where: WeH 4623

When: MW 1:30 - 2:50pm

<http://www.cs.cmu.edu/afs/cs.cmu.edu/project/cmt-55/lti/Courses/731/www/syllabus-07.pdf>

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This course will be taught jointly by:

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Guest Lecturer: Jaime Carbonell, Eric Nyberg, Ralf Brown, Stephan Vogel

1. Course Objectives:

The main objectives of the course are:

- Obtain a basic understanding of MT systems and MT-related issues.
- Learn about theory and approaches in Machine Translation.
- Learn about basic techniques for MT development, in preparation for the MT Lab course and real-world MT system project development.
- Obtain in-depth knowledge of one current topic in MT or
Perform an analysis of a given MT problem, matching it with the most suitable techniques.
(research, report and presentation)

2. Reading Materials

Copies of course reading materials will be provided.

2.1. Past MT course description

Mitamura, Teruko, Eric Nyberg, Robert Frederking (2003) "Teaching MT in a Graduate Language Technologies Program" Proceedings of the MT Summit IX 2003 workshop "Teaching Translation Technologies and Tools", New Orleans.

<http://www.cs.cmu.edu/afs/cs.cmu.edu/project/cmt-55/lti/Courses/731/www/cmu-mt.pdf>

3. Prerequisites

- 11-721 "Grammars and Lexicons" or equivalent background is recommended, but not required.
- 11-711 "Algorithms for NLP" or equivalent background is recommended, but not required.

4. Course Requirements

1. Homework: 2-3 assignments on lecture material (25%)
2. In Class Exams (30%)
3. Term Project: (total 45%)
 - Class presentation and participation (10%)
 - Written Paper (35%)

5. Course Schedule

Date	Topics
Introduction to MT	
Jan 17 W	Overview (Mitamura) - Goals of MT - Course Description - Term Project Explanation
Jan 22 M	History of MT (Carbonell)
Jan 24 W	Principles of MT Research and Development (Lavie)
Modern Theory and Approaches for MT	
Jan 29 M	Manual MT Evaluation and Human Factors (Frederking)
Jan 31 W	Automatic MT Evaluation (Lavie)
Feb 5 M	Transfer Methods (Lavie)
Feb 7 W	Interlingua MT (Mitamura) Home Work assignment (1), Due on Feb 19
Feb 12 M	Statistical MT (Frederking)
Feb 14 W	Example-based MT (Frederking) Term Project Initial Proposal Due
Feb 19 M	Multi-Engine MT (Lavie) Home Work Assignment (1) Due Home Work assignment (2), Due on Mar 5

Linguistic Analysis for MT System Development

- Feb 21 W Linguistic Knowledge Development (1) (Mitamura)
- Analysis Knowledge Sources
- Feb 26 M Linguistic Knowledge Development (2) (Mitamura)
- Analysis Knowledge Sources
- Feb 28 W Linguistic Knowledge Development (3) (Mitamura)
- Generation Knowledge Sources
- Mar 5 M Linguistic Knowledge Development (4) (Mitamura)
- Generation Knowledge Sources
Home Work Assignment (2) Due
Home Work Assignment (3), Due on Apr 2
- Mar 7 W Ambiguity & Ambiguity Resolution (Mitamura)
Term Project Final Proposal Due

Mar 12 M Spring Break (No class)

Mar 14 W Spring Break (No class)

MT System Development: Case Study

- Mar 19 M Statistical MT: (Vogel)
- Mar 21 W Example-based MT: (Brown)
- Mar 26 M Transfer MT: Learning MT Transfer Rules (Lavie)
- Mar 28 W Speech-to-Speech MT System Development (Frederking)
- Apr 2 M Interlingual MT: KANTOO system (Mitamura/Nyberg)
Home Work Assignment (3) Due
- Apr 4 W Business Case for MT and Commercial MT (Frederking)
- Apr 9 M **Exam** (in class, close book exam)

Term Project Presentation

- Apr 11 W Term Project Presentation & Discussion
- Apr 16 M Term Project Presentation & Discussion
- Apr 18 W Term Project Presentation & Discussion

Apr 23 M	Term Project Presentation & Discussion
Apr 25 W	Term Project Presentation & Discussion
Apr 30 M	Term Project Presentation & Discussion
May 2 W	Term Project Presentation & Discussion
May 7 M	Final Term Project Paper Due

6. Student Term Projects:

The term project is an individual piece of research, undertaken by the student with supervision by one or more of the faculty members teaching the course.

Project grades will be based on:

- The quality of the research performed,
- An in-class presentation / demonstration of the work,
- A final written report.

7. MT Conferences and Web Pages:

- AMTA Home Page: <http://www.amtaweb.org/>
- Asia-Pacific Association for Machine Translation (AAMT): <http://www.aamt.info/>
- The European Association for Machine Translation (EAMT): <http://www.eamt.org/>
- International Conference on Theoretical and Methodological Issues in Machine Translation (TMI)
TMI 2004 Web Page: <http://tmi04.his.se/tmi04/>
TMI 2002 Web Page: <http://www.kecl.ntt.co.jp/events/tmi/>
TMI 99 Web Page: <http://www.ccl.umist.ac.uk/events/tmi99/>
- MT Summit Conferences:
MT Summit XI (2007) Denmark, 10-14 September 2007
MT Summit X (2005) Phuket, Thailand, 12-16 September 2005
MT Summit IX (2003): <http://www.amtaweb.org/summit/>
MT Summit IIIX (2001): <http://www.lim.nl/eamt/summitVIII/index.html>
- Conference of the Association for Machine Translation in the Americas (AMTA)
AMTA 2006: <http://amta2006.amtaweb.org/>
AMTA 2004: <http://www.amtaweb.org/AMTA2004/>
AMTA 2002: <http://www.amtaweb.org/AMTA2002/>
AMTA 2000: <http://www.isi.edu/natural-language/conferences/AMTA2000.html>
- The European Association for Machine Translation
EAMT 2006: <http://eamt.emmtee.net/>
EAMT 2005: <http://www.eamt.org/eamt2005/>
- International Workshop on Controlled Language Applications (CLAW)
CLAW 2006: <http://amta2006.amtaweb.org/>
EAMT/CLAW 2003: <http://www.eamt.org/eamt-claw03/>
CLAW 2000: <http://www.up.univ-mrs.fr/~veronis/claw2000/>

CLAW 1998: <http://www.lti.cs.cmu.edu/CLAW98/>

8. Other Conferences and Web Pages:

- ACL Home Page: <http://www.aclweb.org/>
- EACL Home Page: <http://www.eacl.org/>
2006: <http://eacl06.itc.it/index.htm/>
- HLT/NAACL:
2007: <http://www.cs.rochester.edu/meetings/hlt-naacl07/>
- COLING:
2006: <http://www.acl2006.mq.edu.au/>
- LREC:
2006: <http://www.lrec-conf.org/lrec2006/>
2004: <http://www.lrec-conf.org/lrec2004/>
2002: <http://www.lrec-conf.org/lrec2002/>

9. Additional Resources:

Journals:

- "Computers and Translation" or "Machine Translation" Journal, Kluwer Academic Publishers

Books:

- Harold Somers (ed.) (2003) "Computers and Translation: A translator's guide", John Benjamins Publishing Company, Amsterdam/Philadelphia.
- Arnold, D, L. Balkan, R.L. Humphreys, S. Meijer, L.Sadler (1994). "Machine Translation - An Introductory Guide", NCC Backwell Ltd., Oxford, UK. <http://www.essex.ac.uk/linguistics/clmt/MTbook/HTML/book.html>
- Dorr, B. J. (1993). "Machine Translation: A View from the Lexicon", Cambridge, MA: MIT.
- Goodman, Kenneth and Sergei Nirenburg (eds.) (1991) "The KBMT Project: A Case Study in Knowledge-Based Machine Translation", Morgan Kaufmann Publishers, San Mateo.
- Hutchins, John W. and Harold L. Somers, (1992) "An Introduction to Machine Translation", Academic Press, San Diego.
- Hutchins, John W. (ed.) (2000), "Early Years in Machine Translation", John Benjamins.
- Hutchins, John W. (1986) "Machine Translation: Past, Present, Future", Ellis Horwood Limited, England.
- Nagao, Makoto (1989) "Machine Translation: How Far Can It Go?", Oxford University Press, (translated by Norman D. Cook).
- Nirenburg, Sergei, Jaime Carbonell, Masaru Tomita, and Kenneth Goodman, (1992) "Machine Translation: A Knowledge-Based Approach", Morgan Kaufmann Publishers, San Mateo.
- Nirenburg, Sergei (ed.) (1987) "Machine Translation: Theoretical and Methodological Issues", Cambridge University Press.
- Trujillo, Arturo (1999) "Translation Engines: Techniques for Machine Translation", Springer-Verlag Series on Applied Computing.

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