

Matthias Eck

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Summary

- Ph.D. candidate in computer science with research interests in natural language processing and related areas.
- Research focus on Statistical Machine Translation, specifically approaches to low cost portability, limited resource situations and model adaptation.
- Participated in competitive evaluations and realized solutions for real-world environments.
- Experienced software engineer, familiar with all common programming languages and techniques

Education

2002-Present University of Karlsruhe Karlsruhe, Germany
Ph.D. candidate, computer science (at InterACT Research, Carnegie Mellon University, Pittsburgh, PA)

1997-2002 University of Karlsruhe Karlsruhe, Germany
M.S., computer science (German diploma degree), GPA 1.2/1.0
Majors: Telematics, Graphics; Minors: Operations Research, Physics

Professional Experience

2003-Present Carnegie Mellon University, InterACT Research Pittsburgh, PA
Research assistant - Research in Statistical Machine Translation

- Developed methods for Low Cost Portability to new languages
- Adapting translation systems to low memory devices
- Extensive research on adaptation methods for language and translation modeling
- Tourism, medical, and force protection domain translations
- Major Projects: TransTac, GALE, IWSLT, C-STAR, STR-DUST, TIDES, PF-STAR, STEEM

2005-Present Mobile Technologies, LLC Pittsburgh, PA
Consultant - Developed portable translation systems (part time)

2002-2003 University of Karlsruhe, InterACT Research Karlsruhe, Germany
Research assistant - Research in Statistical Machine Translation

1999-2002 University of Karlsruhe, IAKS Karlsruhe Karlsruhe, Germany
Student Research assistant - Developed a simulator for quantum circuits

Teaching Experience

1999-2002 University of Karlsruhe Karlsruhe, Germany
Teaching Assistant - 6 Undergraduate and Graduate courses

Computer Skills

Programming Languages

Java, C/C++, Perl, PHP, Python, Delphi/Pascal, Visual Basic, HTML, LaTeX, SQL, Renderman

Operating Systems

Linux, Windows

Professional Activities

SMT Related Evaluations

TIDES 2003, 2004; GALE 2006, 2007; IWSLT 2005, 2006; TransTac January 2007, July 2007

Projects/Workshops

Site Project Manager for PF-STAR project, 2002-2004

Co-Organizer of IWSLT 2005 & 2006 & 2007

Selected Honors and Awards

2002	Graduation Award from University of Karlsruhe (Ranked in top 10% of graduating class)
2000-2002	Scholarship from IBM Consulting Germany
2000	Scholarship from sd&m Germany
1995	Award – German Federal Competition – Computer Science
1995	Award – German Federal Competition – German History

Professional Memberships

ACL - Association for Computational Linguistics

ACM - Association for Computing Machinery

CM Network

Volunteer Experience

2004-Present	Big Brothers Big Sisters of Greater Pittsburgh	Pittsburgh, PA
	Worked with troubled youths in bi-weekly meetings	

Significant Development Projects

- 2002-Present CMU Statistical Machine Translation Toolkit
Co-developer and daily user in an international team of 10-15
Designed and implemented algorithms for Low Cost Portability, model pruning, and model adaptation
Introduced new method to improve translation of unknown words
Applied Unified Medical Language System to improve medical domain translations
Implemented Bloomfilter approach to increase possible language model size
Programming Languages and Skills: C/C++, Perl, Shell scripting, Java
- 2005-Present Portable Translation/Translation System for Tactical Use (TransTac)
Portable Translation systems on PDA and Laptop
Responsible for translation systems: Japanese↔English, Iraqi↔English, Tagalog↔English, Indonesian↔English
Introduced Wii Remote to simplify Human-Computer Interaction
Responsible for Training Materials/Training of US Marines at TransTac evaluations
Programming Languages and Skills: C/C++, Perl, Bluetooth
- 2005-Present Online Server for Machine Translation Evaluation
Main architect and developer, additional development at Air Force Research Lab
Users upload translations and have them evaluated according to all common automatic machine translation scores (BLEU, NIST, METEOR, WER, PER,...)
Evaluation service provided for IWSLT 2005, IWSLT 2006 and planned for IWSLT 2008
Available as online servers on the WWW (e.g. <http://www.is.cs.cmu.edu/mteval>)
Programming Languages and Skills: Linux, Apache, MySQL, PHP, HTML, Javascript, SSI, Python, Perl
- 2001-2002 Semantic Network - Navigation and Search Prototype
Prototype of a visual navigation and search tool for courseware content
Visual view of semantic networks allows building and navigation
Programming Languages and Skills: Visual Basic, Microsoft Access, XML for courseware description
- 2000-2002 QuaSi – Simulator for Quantum Circuits
Main architect and developer
Simulation of arbitrary quantum circuits, up to 20 qubits
Available as an applet on the WWW (<http://iaks-www.ira.uka.de/QIV/QuaSi>)
Programming Languages and Skills: Java, Java applets, XML file format for quantum circuits

Selected Publications

Conference Papers

Nguyen Bach, Matthias Eck, Paisarn Charoenpornasawat, Thilo Köhler, Sebastian Stüker, ThuyLinh Nguyen, Roger Hsiao, Alex Waibel, Stephan Vogel, Tanja Schultz, Alan W. Black. *The CMU TransTac 2007 Eyes-free and Hands-free Two-way Speech-to-Speech Translation System*, Proceedings of IWSLT 2007, Trento, Italy, October 2007.

Matthias Eck, Stephan Vogel, and Alex Waibel. *Estimating Phrase Pair Relevance for Translation Model Pruning*, Proceedings of MT Summit XI, Copenhagen, Denmark, September 2007.

Matthias Eck, Stephan Vogel, and Alex Waibel. *Translation Model Pruning via Usage Statistics for Statistical Machine Translation*, Proceedings of HLT 2007, Rochester, NY, April 2007.

Matthias Eck, Ian Lane, Nguyen Bach, Sanjika Hewavitharana, Muntsin Kolss, Bing Zhao, Almut Silja Hildebrand, Stephan Vogel, and Alex Waibel. *The UKA/CMU Statistical Machine Translation System for IWSLT 2006*, Proceedings of IWSLT 2006, Kyoto, Japan, November 2006.

Matthias Eck, Stephan Vogel, and Alex Waibel. *A Flexible Online Server for Machine Translation Evaluation*, Proceedings of EAMT 2006, Oslo, Norway, June 2006.

Matthias Eck and Chiori Hori. *Overview of the IWSLT 2005 Evaluation Campaign*, Proceedings of IWSLT 2005, Pittsburgh, USA, October 2005.

Matthias Eck, Stephan Vogel and Alex Waibel. *Low Cost Portability for Statistical Machine Translation based in N-gram Frequency and TF-IDF*, Proceedings of IWSLT 2005, Pittsburgh, USA, October 2005.

Matthias Eck, Stephan Vogel and Alex Waibel. *Low Cost Portability for Statistical Machine Translation based on N-gram Coverage*, Proceedings of MT Summit X, Phuket, Thailand, September 2005.

Almut Silja Hildebrand, Matthias Eck, Stephan Vogel, and Alex Waibel. *Adaptation of the Translation Model for Statistical Machine Translation based on Information Retrieval*, Proceedings of EAMT 2005, Budapest, Hungary, May 2005.

Matthias Eck, Stephan Vogel, and Alex Waibel. *Improving Statistical Machine Translation in the Medical Domain using the Unified Medical Language System*, Proceedings of Coling 2004, Geneva, Switzerland, August 2004.

Bing Zhao, Matthias Eck, and Stephan Vogel. *Language Model Adaptation for Statistical Machine Translation via Structured Query Models*, Proceedings of Coling 2004, Geneva, Switzerland, August 2004.

Matthias Eck, Stephan Vogel, and Alex Waibel. *Language Model Adaptation for Statistical Machine Translation based on Information Retrieval*, Proceedings of LREC 2004, Lisbon, Portugal, May 2004.

Karsten Krutz, Matthias Eck, Christian Mayerl, Matthias Riechmann and Sebastian Abeck. *Semantische Suche zur Unterstützung des Internet-basierten Wissenstransfers*, e-Learning Workshop KIVS, Leipzig, Germany, 2003. (In German) [Semantic Networks Supporting Internet-based Knowledge Transfer].

(Co-)Advised Master's Theses

Martin Raab. *Language Model Techniques in Machine Translation*. October 2006.

Almut Silja Hildebrand. *Translation Model Adaptation for Statistical Machine Translation using Information Retrieval*. October 2005.

Master's Thesis

Matthias Eck. *Wissensnetze zur Navigation und semantischen Suche in der Internet-basierten Aus- und Weiterbildung*. May 2002. (In German) [Semantic Networks for Navigation and Search Applied to Internet-based Knowledge Transfer].

Selected Conference Presentations

Estimating Phrase Pair Relevance for Translation Model Pruning. MT Summit XI, Copenhagen, Denmark, September 2007.

Translation Model Pruning via Usage Statistics for Statistical Machine Translation. HLT 2007, Rochester, NY, April 2007.

The UKA/CMU Statistical Machine Translation System for IWSLT 2006. IWSLT 2006, Kyoto, Japan, November 2006.

A Flexible Online Server for Machine Translation Evaluation. EAMT 2006, Oslo, Norway, June 2006.

Overview of the IWSLT 2005 Evaluation Campaign. IWSLT 2005, Pittsburgh, PA, October 2005.

Low Cost Portability for Statistical Machine Translation based in N-gram Frequency and TF-IDF. IWSLT 2005, Pittsburgh, PA, October 2005.

Improving Statistical Machine Translation in the Medical Domain using the Unified Medical Language System. Coling 2004, Geneva, Switzerland, August 2004.

Language Model Adaptation for Statistical Machine Translation via Structured Query Models. Coling 2004, Geneva, Switzerland, August 2004.

References

Available upon request.

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