Robert Eric Frederking

Language Technologies Institute (LTI)
Carnegie Mellon University
5000 Forbes Avenue
Pittsburgh, PA 15213-3890

Internet: ref@cs.cmu.edu
Phone: (412) 268-6656

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EDUCATION:

Carnegie Mellon University	PhD	Computer Science (AI)	12/86
Carnegie Mellon University	MS equivalent	Computer Science (AI)	5/81
Case Western Reserve Univ.	BS	Computer Engineering	1/77

CLEARANCES: None.

POSITIONS HELD: Carnegie Mellon University, LTI, 12/91-present
Senior Systems Scientist. Currently serving as senior personnel on **Mega-RADDMT** and **NESPOLE!** speech translation projects, working with Mandarin, Italian, German, and French, and soon Arabic, in both text and speech translation. Also working on **MuchMore** cross-language IR and **JAVELIN** question-answering projects.

Previously lead the **DIPLOMAT** rapid-deployment speech translation project as a co-Principal Investigator. Spearheaded initial development of Croatian, requiring coordination of several research groups at CMU, acquiring Croatian language resources, and adapting PANGLOSS user interfaces for initial Lisp-based demo of Croatian translation. Responsible for supervising development of language resources in Croatian, Korean, Haitian Creole, and Spanish. Responsible for day-to-day management of project, plus long-range planning in hiring, equipment purchasing, and budgeting, and liaison with funding agency (DARPA) and other groups. Also responsible for overall technical design of project, including system integration, graphical user interfaces (GUIs), and human factors experiments. Served as CMU Principle Investigator for the follow-on **TONGUES** system, which was successfully field-tested in Zagreb, Croatia, in April 2001.

Previously was co-Principal Investigator and ‘‘System Integrator’’ for **PANGLOSS** project, a joint project between CMU’s CMT, New Mexico State University’s Computer Research Laboratory (NMSU/CRL), and the University of Southern California’s Information Sciences Institute (USC/ISI). Primary responsibility was creating and maintaining major integrated research software system based on three large component systems. Integration work involved both technical and managerial skills, from high-level planning through design to low-level implementation, over a very wide-ranging set of problems including Knowledge-Based MT (KBMT) system design, GUI issues, and multiple-machine Prolog/Lisp communication systems. Also designed and carried out internal testing, test subject selection and training, and ARPA MT evaluations.

Carnegie Mellon University, Robotics Institute, 8/89-11/91
Project Scientist. Worked on the CORTES and CARMEMCO projects. Developed the CORTES interactive, graphical testbed planner. Adapted this planner to work as a GUI for the CARMEMCO object-oriented enterprise simulator.

Siemens AG, Corporate Research and Technology, Munich, 12/86-6/89
Research Engineer. Worked on the WISBER German natural language interface (NLI), on design and implementation of an LFG parser’s grammar compiler, a semantic interpretation rule interpreter and programmer’s user interface, pronoun resolution heuristics (not implemented), an internal representation translation module, and a Prolog natural language generator.

Carnegie Mellon University, Computer Science Department, 9/79-12/86
Research assistant. Carried out directed research on dialogue ellipsis resolution and the Psli3 production system NLI; developed dialogue and ellipsis resolution modules of XCALIBUR NLI.

Carnegie Group Inc., 3/84-9/86
Consultant for LanguageCraft, Tess, and KnowledgeCraft/LanguageCraft integration, and **instructor** in AI course. Designed and implemented English natural language generator for paraphrasing ambiguous parses; designed and implemented case-frame-based ellipsis resolution mechanism. Included significant GUI work for demos.

PROJECT-RELEVANT PUBLICATIONS:

[1] Frederking, R., Rudnicky, A., Hogan, C., and Lenzo, K. Interactive Speech Translation in the Diplomat Project. Machine Translation Journal, Special issue on Spoken Language Translation. 2001.

[2] Hogan, C. and Frederking, R.E. An Evaluation of the Multi-engine MT Architecture. In Proceedings of the Third Conference of the Association for Machine Translation in the Americas (AMTA '98). October 1998.

[3] Brown, R. and Frederking, R. Applying Statistical English Language Modeling to Symbolic Machine Translation. In the Proceedings of the Sixth International Conference on Theoretical and Methodological Issues in Machine Translation (TMI-95), pp. 221-239, 1995.

[4] Frederking, R. and Nirenburg, S. Three Heads are Better than One. In the Proceedings of the fourth Conference on Applied Natural Language Processing, ANLP-94, Stuttgart, Germany, 1994.

[5] Frederking, R., Grannes, D., Cousseau, P., and Nirenburg, S. The Integration of MT and MAT. In Proceedings of the first Conference of the Pacific Association for Computational Linguistics (PACLING). Vancouver, Canada, April 1993.

OTHER PUBLICATIONS:

[6] Frederking, R., Nirenburg, S., Farwell, D., Helmreich, S., Hovy, E., Knight, K., Beale, S., Domashnev, C., Attardo, D., Grannes, D., Brown, R. Integrating Translations from Multiple Sources within the Pangloss Mark III Machine Translation. In the Proceedings of the first conference of the Association for Machine Translation in the Americas, AMTA-94, Columbia, MD, 1994.

[7] Frederking, R., Grannes, D., Cousseau, P., and Nirenburg, S. An MAT Tool and Its Effectiveness. In Proceedings of the DARPA Human Language Technology Workshop, Princeton, NJ, 1993.

[8] Carbonell, Jaime G., Yang, Yiming, Frederking, Robert E., Brown, Ralf D., Geng, Yibing, Lee, Danny. Translingual Information Retrieval: A Comparative Evaluation. In Proceedings of the Fifteenth International Joint Conference on Artificial Intelligence (IJCAI-97). Nagoya, Japan, 1997. Best paper award.

[9] Yang, Y., Carbonell, J.G., Brown, R.D., and Frederking, R.E. Bilingual Corpus-Based Approaches to Translingual Information Retrieval. Applied Artificial Intelligence Journal, January 1999. Special Issue: Best of MULSAIC-97.

[10] Frederking, R.E. Integrated Natural Language Dialogue: A Computational Model. Kluwer Academic Publishers, Boston, 1988. Book version of PhD dissertation.

COLLABORATING RESEARCHERS OUTSIDE OF CMU:

Eduard Hovy	Information Sciences Institute, USC
Nancy Ide	Department of Computer Science, Vassar College
Kevin Knight	Information Sciences Institute, USC

LIST OF ADVISED PHD STUDENTS:

Liren Chen School of Computer Science, Carnegie Mellon University
Total: 1 PhD, 5 Masters students, 0 Post-docs.

LIST OF GRADUATE AND POST-GRADUATE ADVISORS:

Jaime Carbonell	School of Computer Science, Carnegie Mellon University