

Margaret M. Fleck

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Current work and interests

My recent work centers around understanding conversational speech. At HP labs, I built a prototype interface for indexing personal photograph collections using stories that people tell about them. At Illinois, our Groupscope project is collecting and annotating training sessions for emergency responders. I have also been investigating the possible use of prosodic features (e.g. stress, duration) in language modelling and language acquisition.

I worked in image understanding for many years and retain an interest in that area. I also have a long-term interest in building better programming language support for both computer vision and natural language applications. Recently, I implemented a hybrid Scheme/C package for supporting linguistics research.

Education

B.A., Linguistics, May 1982, Yale University.

Summa cum laude, exceptional distinction in linguistics, Hadley prize (highest scholarship in social sciences). Senior thesis: “Design options for a morphological analysis system” (advisor: Judith Aissen).

M.S., Electrical Eng. and Computer Science, September 1985, Mass. Institute of Technology.

Thesis: “Local Rotational Symmetries” (advisor: J. Michael Brady).

Ph.D., Electrical Eng. and Computer Science, September 1988, Mass. Institute of Technology.

Thesis: “Boundaries and Topological Algorithms,” (advisors: J. Michael Brady and Harold Abelson).
Minor: algebraic topology.

Visiting student, Keble College, Oxford University, October 1986–August 1987.

Employment

Summer 1979: Smith College, Northampton, MA, helping set up the new VAX system at the Science Center.

Summer employee in the linguistics and robotics departments at AT&T Bell Laboratories, 600 Mountain Ave., Murray Hill, NJ:

1980, 1982: syntactic parsing research under Mitchell P. Marcus.

1981: locating syllables in speech waveforms under Mark Y. Liberman.

1983: representing Finnish morphology under Janet Pierrehumbert.

1986: depth of objects from camera motion under Michael K. Brown.

BP Junior Research Fellow, St. Cross College and Department of Engineering Science, Oxford University, September 1988 to September 1991 (supervisor: J. Michael Brady).

Assistant Professor (until spring 1996) and Associate Professor, Department of Computer Science, University of Iowa, Iowa City, IA 52242, Fall 1991 to Spring 1997 (granted tenure).

Associate Professor, Department of Computer Science, Harvey Mudd College, Claremont, CA 91711, July 1997 to June 2000.

Researcher, Hewlett-Packard Labs, 1501 Page Mill Rd, Palo Alto, CA 94304, July 2000 to April 2004

University of Illinois, Urbana IL, Research Associate Professor/Senior Lecturer, August 2004 to present.

Fellowships and Grants

Graduate fellowship from the Fannie and John Hertz Foundation (1982–1987).

Grant from the AT&T Bell Laboratories Graduate Research Program for Women (1982–1988).

GE Foundation Faculty Fellowship Grant, \$22,940, fall 1991–summer 1992.

NSF CISE Research Instrumentation Grant, “Vision and Simulation Projects at the University of Iowa,” \$150,000, April 1992 through September 1993, [with Joe Kearney and David Forsyth], CDA-9121985.

NSF Research Initiation Award, “Finding Boundaries in Variable Scale Images” \$110,000, July 1992 through June 1996, IRI-9209728.

NSF Research Experience for Undergraduates, site grant, \$225,000, [with Joe Kearney], February 1994 through July 1997, CDA-9322132.

Author, successful departmental proposal to the U. Iowa Computing Fee Committee (1993) for a new undergraduate teaching laboratory.

NSF grant “Wide-angle Symmetry,” July 1995 through June 1999, \$187,000, IRI-9420716/IRI-9796311.

NSF CAREER development award “Finding Image Intensity Boundaries,” August 1995 through July 1999, \$135,000, IRI-9501493/IRI-9796307.

NSF Research Experience for Undergraduates, site grant, \$241,295 [with Jim Cremer and Joe Kearney], March 1997 through February 2000, CDA-9619957.

Groupscope, \$1,697,500, Scott Poole et al. [8 of us on the grant], NSF, summer 2010 to summer 2014.

“Teaching Computing at Scale”, Aug 2012–July 2014 U. Illinois College of Engineering SIIP program, \$200,000, [with L. Angrave, C. Heeren, L. Pitt, C. Zilles]

Journal papers

Margaret M. Fleck (1981) “Tzotzil Numeral Root Morphology,” *Journal of Mayan Linguistics* 3/1, pp. 5–24.

Margaret M. Fleck (1988) “Representing Space for Practical Reasoning,” *Image and Vision Computing* 6/2, pp. 75–86.

Margaret M. Fleck (1991) “A Topological Stereo Matcher,” *Intern. Journ. Comp. Vision* 6/3, pp. 197–226.

Margaret M. Fleck (1992) “Some Defects in Finite Difference Edge Finders,” *IEEE Trans. Patt. Analy. Mach. Intell.* 14/3, pp. 337–345.

Margaret M. Fleck (1992) “Multiple Widths Yield Reliable Finite Differences,” *IEEE Trans. Patt. Analy. Mach. Intell.* 14/4, pp. 412–429.

Margaret M. Fleck (1996) “The Topology of Boundaries,” *Artificial Intelligence* 80, pp. 1–27.

Folberg, Robert, Margaret Fleck, Mary G. Mehaffey, Margaret Meyer, Suzanne Bentler, Robert Woolson, Jacob Pe’er (1996) Mapping the Location of Prognostically Significant Vascular Patterns in Ciliary Body and Choroidal Melanomas, *Pathology Oncology Research* 2/4, pp. 229–236.

David Forsyth and Margaret Fleck (1999) “Automatic Detection of Human Nudes,” *International Journal of Computer Vision* 32/1, pp. 63–77.

Margaret Fleck, Marcos Frid, Tim Kindberg, Eamonn O’Brian-Strain, Rakhi Rajani, Mirjana Spasojevic (2002) “From Informing to Remembering: Ubiquitous Systems in Interactive Museums,” *IEEE Pervasive Computing* 1/2, pp. 13–21

Refereed Conference Papers

Margaret M. Fleck and Mark Y. Liberman (1982) “Test of an Automatic Syllable Peak Detector,” 104th Meeting of the Acoustical Society of America, abstract in *Journal of the Acoustical Society of America*, supplement to vol. 72, pp. S78–S79.

Mitchell Marcus, Don Hindle, Margaret M. Fleck (1983) “D-Theory: Talking about Talking about Trees,” *Proceedings of the 21st Annual Meeting of the Association for Computational Linguistics*, pp. 129–136.

Margaret M. Fleck (1986) “Local Rotational Symmetries,” *Proc. of the IEEE Conf. on Computer Vision and Pattern Recognition*, pp. 332–337.

Margaret M. Fleck (1987) “Representing Space for Practical Reasoning,” *Proceedings of the Tenth International Joint Conference on Artificial Intelligence*, pp. 728–730.

Margaret M. Fleck (1987) “Representing Space for Practical Reasoning,” *Proc. of the Third Alvey Vision Conference*, pp. 275–284. [Slightly different from previous paper.]

Brady, M. and Cameron, S. and Durrant-Whyte, H. and Fleck, M. and Forsyth, D. and Noble, A. and Page, I. (1987) “Progress towards a System that can Acquire Pallets and Clean Warehouses,” *Proc. of the Fourth International Symposium on Robotics Research*, Santa Cruz, California, pp. 359–374.

Margaret M. Fleck (1989) “Spectre: An Improved Phantom Edge Finder,” *Proc. of the Fifth Alvey Vision Conference*, pp. 127–132.

Margaret M. Fleck (1990) “Multiple Widths Yield Reliable Finite Differences,” *Proc. Third International Conference on Computer Vision*, pp. 58–61.

Margaret M. Fleck (1990) “Classifying Symmetry Sets,” *Proc. British Machine Vision Conference*, pp. 297–302.

Margaret M. Fleck (1992) “Texture: Plus ça change...”, *Proceedings of the European Conference on Computer Vision*, Lecture Notes in Computer Science 588, Springer-Verlag, Berlin, pp. 151–159.

Margaret M. Fleck (1994) “Practical edge finding with a robust estimator,” *Proc. of the IEEE Conf. on Computer Vision and Pattern Recognition*, pp. 649–653.

Daniel E. Stevenson and Margaret M. Fleck (1995) "Robot Aerobics: Four Easy Steps to a More Flexible Calibration," *Intern. Conf. on Computer Vision* 1995, pp. 34–39.

Margaret Fleck, David Forsyth, and Chris Bregler (1996) "Finding Naked People," 1996 *European Conference on Computer Vision* pp. 593–602.

J. Pe'er, M. G. Mehafeey M. G., M. Fleck, M. Meyer, S. E. Bentler, R. Woolson, R. Folberg (1996) "Significance of quantifying and localizing vascular networks in choroidal and ciliary body melanomas," presented at ARVO, abstract in *Suppl Invest Ophthalmol Vis Sci* 37: S207.

Forsyth, D.A., Malik, J., Fleck, M.M., Greenspan, H., Leung, T., Belongie, S., Carson, C. and Bregler, C., "Finding pictures of objects in large collections of images," *Proc. ECCV 96 International Workshop on Object Representation in Computer Vision*, Cambridge UK, 1996, p. 335–361.

Daniel E. Stevenson and Margaret M. Fleck (1996) "Nonparametric Correction of Distortion," *IEEE Workshop on Applications of Computer Vision 1996*, pp. 214–219 .

David A. Forsyth and Margaret M. Fleck (1996) "Identifying nude pictures," *IEEE Workshop on the Applications of Computer Vision 1996*, pp. 103–108.

Jitendra Malik, David Forsyth, Margaret Fleck, Hayit Greenspan, Thomas Leung, Chad Carson, Serge Belongie, and Chris Bregler, "Finding Objects in Image Databases by Grouping," *International Conference on Image Processing (ICIP)* 1996.

Forsyth, D.A., Malik, J., Fleck, M.M., Leung, T., Bregler, C., Carson, C. and Greenspan, H., " Finding pictures of objects in large collections of images", *Proceedings of the Clinic on Library Applications of Data Processing*, 1996.

Daniel E. Stevenson and Margaret M. Fleck (1997) "Programming Language Support for Digitized Images or, The Monsters in the Closet," 1997 Usenix conference on Domain-Specific Languages, pp. 271–284.

David A. Forsyth and Margaret M. Fleck (1997) "Body Plans," IEEE Conference on Computer Vision and Pattern Recognition 1997, pp. 678-683.

Forsyth, D.A. and Fleck, M.M., "Finding People and Animals by Guided Assembly," *Proc. Intern. Conf. on Image Processing* 1997, vol. III, pp. 5-9.

Chung, M.G., M.M. Fleck, and D.A. Forsyth (1998) "Jigsaw Puzzle Solver using Shape and Color," 4th Intern. Conf. Signal Proc. 1998 (October 12-16, 1998).

Chung, M.G., M.M. Fleck, and D.A. Forsyth (1998) "New puzzle assembly," SPIE International Symposium on Multispectral Image Processing (ISMIP'98), Wuhan, China (Oct. 21-23, 1998), SPIE Vol. 3545.

Margaret Fleck, Marcos Frid, Tim Kindberg, Eamonn O'Brien-Strain, Rakhi Rajani, Mirjana Spasojevic (2002) "Rememberer: A Tool for Capturing Museum Visits," *UbiComp 2002*, pp. 48-55

Margaret Fleck (2008) "Lexicalized Phonotactic Word Segmentation," *Annual Meeting of the Association for Computational Linguistics*, pp. 130-138.

Tim Mahrt, Jui-Ting Huang, Yoonsook Mo, Margaret Fleck, Mark Hasegawa-Johnson and Jennifer Cole (2011) "Optimal Models of prosodic prominence using the Bayesian Information Criterion," *Interspeech* 2011.

Tim Mahrt, Jennifer Cole, Margaret Fleck and Mark Hasegawa-Johnson (2012) "Modelling speaker variation in cues to prominence using the Bayesian information criterion," *Speech Prosody* 2012.

Tim Mahrt, Jennifer Cole, Margaret Fleck and Mark Hasegawa-Johnson (2012) "F0 and the Perception of Prominence," *Interspeech* 2012.

Papers in refereed conferences/workshops without proceedings

Gorman, K., Cole, J., Hasegawa-Johnson, M., and Fleck, M. (2007). Automatic detection of turn-taking cues in spontaneous speech based on prosodic factors. Annual Meeting of the Linguistics Society of America.

Tim Mahrt, Jui-Ting Huang, Yoonsook Mo, Jennifer Cole, Mark Hasegawa-Johnson and Margaret Fleck (2011) "Feature Sets for the Automatic Detection of Prosodic Prominence," New Tools and Methods for Very-Large-Scale Phonetics Research, Univ. of Pennsylvania, January 2011.

Miscellaneous publications and invited talks

Margaret M. Fleck (1997) "Equal Employment Opportunity in the Age of the Internet," Computing Research News, Jan 1997.

Margaret Fleck, "Edge Finding, Cartooning and Topological Image Matching," Mini-Symposium on Model Based Image Coding sponsored by the Rank Prize Funds, Broadway, England, 1988.

Margaret Fleck, "Wide-angle Imaging Geometry," US-Czech workshop (NSF funded), Prague, Czech Republic, 1995.

Margaret Fleck, "Wide-angle Imaging," ALCATECH workshop, Sjallands Odde, Denmark, 1996.

Web resources

Margaret M. Fleck (2012-13) *Building Blocks for Theoretical Computer Science*, textbook released on the web, latest version is 1.3, January 2013. Includes study problems with annotated solutions.

Software releases and patents

Schwa 1.0 (2005) <http://www.cs.uiuc.edu/homes/mfleck/schwa/index.html>

Mark Hasegawa-Johnson and Margaret Fleck (2008) ISLEX Dictionary interim version.

Philippe Debaty, Margaret Fleck, Patrick Goddi (2009) "System for Communicating a story mail between communications devices that extends voice mail," United States Patent 7558561 B1

Technical Reports not subsumed by above

Margaret M. Fleck (1995) "Perspective Projection: the Wrong Imaging Model," Technical Report 95-01, Computer Science, University of Iowa.

Margaret M. Fleck (2003) "Personal Naming Environments," Technical Report HPL-2003-108, Hewlett-Packard Laboratories.

Margaret M. Fleck (2004) "Eavesdropping on Storytelling," Technical Report HPL-2004-44, Hewlett-Packard Laboratories.

Service

Program committee AAAI (1997), ICRA (1997), CVPR (1998, 1998, 1999), WWW (2003), EMNLP (2009, 2013, 2014), IEEE ICSC (2009, 2010, 2017, 2018, 2019), ACL (2011-2019), NAACL (2019), IJCNLP (2017), Area chair CVPR 2000. NSF review panels (1993, 1995, 1996, 1997, and 1998).

U. Iowa Faculty Assembly (1993-96), Faculty Senate (1996-97).

Office Safety Committee, HP labs (2001-04).

U. Illinois departmental:

- Intro Sequence revision: 2006-2007
- Teaching evaluation and improvement (2006-2014)
- Departmental coordinator of TA training and management, fall 2006 to spring 2010
- Coordinator of the CS proficiency exams, spring 2012 to Spring 2018
- Undergrad Study (2006-2014)
- Student Awards committee, 2006 to 2019 (chair 2017-2019)
- Undergrad Student Awards committee chair, 2019 to present
- Student grievance committee, fall 2010 (chair since 2013) to fall 2019
- Faculty undergraduate mentor 2007 to present
- Ad hoc Governance Committee Fall 2015 to Fall 2016
- Instructional designer hiring, allocation committees (spring 2019 to present)

Teaching

Courses taught: Introductory Programming, Data Structures, Discrete Structures (course coordinator), Algorithms and Data Structures, Computer Vision I and II, Artificial Intelligence, Compiler Construction, Theory of Computation.

On list of teachers ranked as excellent at U. Illinois, Spring/Fall 2015, Spring/Fall 2016, Fall 2017, Spring 2018, Spring 2019

Rose Teaching Award (2019)

Supervisor: 3 Ph.D. theses, 5 MS theses, 10 MS/Ph.D. qual projects, 15 undergraduate research projects

Reader: 10 Ph.D. theses, 6 MS theses.

Supervision of student group projects for industrial sponsors (“clinic”): Optivus (1997-98), Legato (1998-99), National Semiconductor (1997-98), Disney (1999-2000)