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March 25, 2012

Education

1988 Ph.D., Applied Linguistics
University of California, Los Angeles
Dissertation: *A Connectionist Model of Sentence Generation in a First and Second Language*

1979 M.A., Teaching English as a Second Language
University of California, Los Angeles
Thesis: *Suprasegmental Meaning in English*

1969 B.A., Mathematics (minors: Physics, German)
San Diego State College, San Diego, California

Employment History

July 1994– Associate Professor
Computer Science Department, Linguistics Department (until 2003), Cognitive Science Program
Indiana University, Bloomington, Indiana

Aug. 1988–July 1994 Assistant Professor
Computer Science Department, Linguistics Department (from 1992), Cognitive Science Program
Indiana University, Bloomington, Indiana

Jan.–June 1991 Visiting Assistant Professor
Department of Linguistics
University of California, San Diego, California

Spring 1988 Visiting Lecturer
Applied Linguistics Program
University of California, Los Angeles, California

1985–1988 Research Assistant
Artificial Intelligence Laboratory, Computer Science Department
University of California, Los Angeles, California

1986–1987 Supplemental Employee
IBM Los Angeles Research Center, Los Angeles, California
Worked on the transfer component of a machine translation system.

1976–1985 Instructor
American Language Center, UCLA Extension, Los Angeles, California
Taught English as a second language to adults and participated in curriculum development.

1974–1976 Various: English as a second language instructor and private tutor; laboratory assistant, UCLA

1969–1973 U. S. Peace Corps Volunteer teacher and teacher supervisor in Ethiopia
U.S. Peace Corps, Washington, D.C.

Publications

Journal Articles

- Colunga, E., Smith, L. B., & Gasser, M. (2009). Correlation versus prediction in children's word learning: cross-linguistic evidence and simulations. *Language and Cognition*, *1*:2.
- Smith, L. B. & Gasser, M. (2005). The development of embodied cognition: six lessons from babies. *Artificial Life*, *11*, 13–30.
- Gasser, M., Eck, D., & Port, R. F. (1999). Meter as mechanism: a neural network that learns metrical patterns. *Connection Science*, *11*, 187–216.
- Gasser, M. & Smith, L. B. (1998). Learning nouns and adjectives: a connectionist account. *Language and Cognitive Processes*, *13*, 269–306.
- Gasser, M., & Lee, C.-D. (1990). Networks that learn about phonological feature persistence. *Connection Science*, *2*, 265–278 (also appears in *Connectionist Natural Language Processing*, pp. 349–362. Ed. Noel Sharkey. Oxford, England: Intellect Books).
- Gasser, M. (1990). Connectionism and universals of second language acquisition. *Studies in Second Language Acquisition*, *12*, 179–199.
- Gasser, M. (1985). Amharic *-m* and *-ss*: Morphology, theme, and assumed knowledge. *Lingua*, *65*, 51–106.

Papers in Conference Proceedings

- Gasser, M. (2012). Toward a rule-based system for English-Amharic translation. *SALTMIL-AfLaT Workshop on Language Technology for Normalisation of Less-Resourced Languages*. Instanbul, Turkey.
- Wondwossen Mulugeta and Gasser, M. (2012). Learning morphological rules for Amharic verbs using inductive logic programming. *SALTMIL-AfLaT Workshop on Language Technology for Normalisation of Less-Resourced Languages*. Instanbul, Turkey.
- Gasser, M. (2011). Computational morphology and the teaching of indigenous languages. In S. Coronel-Molina and J. McDowell (Eds.), *Proceedings of the First Symposium on Teaching Indigenous Languages of Latin America*, pp. 52–63. Center for Latin American and Caribbean Studies, Indiana University, Bloomington, IN, USA.
- Sulaiman, S., Gasser, M., Kübler, S. (2011). Towards a Malay derivational lexicon: learning affixes using Expectation Maximization. *Second Workshop on South and Southeast Asian Natural Language Processing*. Chiangmai, Thailand.
- Gasser, M. (2011). HornMorpho: a system for morphological processing of Amharic, Oromo, and Tigrinya. *Conference on Human Language Technology for Development*, Alexandria, Egypt.

- Anberbir, T., Takara, T., Gasser, M., and Yoon, K. D. (2011). Automatic assignment of geminates and epenthetic vowel in Amharic text-to-speech system. *Conference on Human Language Technology for Development*, Alexandria, Egypt.

- Gasser, M. (2011). Toward synchronous Extensible Dependency Grammar. *International Workshop on Free/Open-Source Rule-Based Machine Translation*, *2*.

- Gasser, M. (2010). Expanding the lexicon for a resource-poor language: using a morphological analyzer and a web crawler. *International Conference on Language Resources and Evaluation*, *7*.

- Gasser, M. (2010). A dependency grammar for Amharic. *Workshop on Language Resources and Human Language Technologies for Semitic Languages*, Valletta, Malta.

- Schrementi, G. and Gasser, M. (2010). Emergent generalization in Bayesian agents using iterated learning. *International Conference on Artificial Life*, *12*, 642–647.

- Schrementi, G. and Gasser, M. (2010). Minimum Description Length and generalization in the evolution of language. *International conference on the Evolution of Language (Evolang8)*.

- Gasser, M. (2009). Semitic morphological analysis and generation using finite state transducers with feature structures. *Conference of the European Chapter of the Association for Computational Linguistics*, *12*.

- Williams, P., Beer, R., and Gasser, M. (2008). An embodied dynamical approach to relational categorization. *Annual Conference of the Cognitive Science Society*, *30*.

- Williams, P., Beer, R., and Gasser, M. (2008). Evolving referential communication in embodied dynamical agents. *International Conference on the Simulation and Synthesis of Living Systems (ALife XI)*, *11*.

- Gasser, M. (2006). Machine translation and the future of indigenous languages. *I Congreso Internacional de Lenguas y Literaturas Indoamericanas*, Temuco, Chile.

- Gasser, M., Hamed, A., Hockema, S., Kane, M., & Sabry, A. (2006). Information is power: intelligent tools for information access and evaluation. *World Forum on Information Society*, Tunis, Tunisia.

- Gasser, M. (2004). The origins of arbitrariness in language. *Annual Conference of the Cognitive Science Society*, *26*, 434-439.

- Gasser, M. (2003). Arbitrariness and iconicity: a new perspective. *Proceedings of Lingüística 2003*, Havana, Cuba.

- Gasser, M. & Colunga, E. (2001). Learning relational correlations. *International Conference on Cognitive Modeling*, *4*.

- Regier, T., Corrigan, B., Cabasaan, M., Woodward, A., Gasser, M. & Smith, L. (2001). The emergence of words. *Annual Conference of the Cognitive Science Society*, *23*.

- Gasser, M. & Colunga, E. (2000). Babies, variables, and relational correlations. *Annual Conference of the Cognitive Science Society*, *22*, 160–165.

- Gasser, M. & Colunga, E. (1999). How babies learn to find words. *International Conference on Cognitive Science*, *2*, 277–281.
- Gasser, M., & Colunga, E. (1999). Babies, variables, and connectionist networks. *Annual Conference of the Cognitive Science Society*, *21*, 794.
- Colunga, E. & Gasser, M. (1998). Linguistic relativity and word acquisition: a computational approach. *Annual Conference of the Cognitive Science Society*, *20*, 244–249.
- Samuelson, L., Gasser, M., & Smith, L. B. (1997). Statistical regularities in input lead to a naming bias: a connectionist model of the shape bias. *Annual Conference of the Cognitive Science Society*, *19*, 1031.
- Schaffert, A., Gasser, M., & Smith, L. B. (1997). Negative evidence drives lexical development. *Annual Conference of the Cognitive Science Society*, *19*, 1038.
- Colunga, E., & Gasser, M. (1997). Where do relations come from? *Annual Conference of the Cognitive Science Society*, *19*, 890.
- Gasser, M. & Eck, D. (1996). Representing rhythmic patterns in a network of oscillators. *Proceedings of the 4th International Conference on Music Perception and Cognition*, 361–366.
- Eck, D. & Gasser, M. (1996). Perception of simple rhythmic patterns in a network of oscillators. *Proceedings of the 18th Annual Conference of the Cognitive Science Society.*
- Gasser, M. (1994). Modularity in a connectionist model of the acquisition of morphology. *International Conference on Computational Linguistics*, *15*, 214–220.
- Gasser, M. (1994). Acquiring receptive morphology: A connectionist model. *Annual Meeting of the Association for Computational Linguistics*, *32*, 279–286.
- Gasser, M. (1993). The structure grounding problem. *Annual Conference of the Cognitive Science Society*, *15*, 149–152. [invited paper]
- Gasser, M. (1992). Phonology as a byproduct of learning to recognize and produce words: a connectionist model. *Proceedings of the Second International Conference on Spoken Language Processing*, 277–280.
- Gasser, M. (1992). Learning distributed syllable representations. *Annual Conference of the Cognitive Science Society*, *14*, 396–401.
- Gasser, M., & Celis, N. (1992). Towards a connectionist approach to transfer in machine translation. *Fourth Annual Conference of the Midwest Artificial Intelligence and Cognitive Science Society*, 1–5.
- Blank, D., & Gasser, M. (1992). Grounding via scanning: cooking up roles from scratch. *Fourth Annual Conference of the Midwest Artificial Intelligence and Cognitive Science Society*, 77–81.
- Gasser, M., & Smith, L. B. (1991). The development of the notion of sameness: a connectionist model. *Annual Conference of the Cognitive Science Society*, *13*, 719–723.

- Gasser, M., & Lee, C.-D. (1991). A short-term memory architecture for the learning of morphophonemic rules. In R. P. Lippmann, J. E. Moody, & D. S. Touretzky (Eds.), *Advances in Neural Information Processing Systems 3*, 605–611. San Mateo, CA: Morgan Kaufmann.

- Gasser, M. (1991). Hierarchies of simple recurrent networks for word recognition and production. In C. P. Dolan (Ed.), *Proceedings of the AAAI Spring Symposium on Connectionism and Natural Language Processing.*

- Lee, C.-D., & Gasser, M. (1990). Learning morphophonemic processes without explicit rules and underlying representations. *Proceedings of the Seoul International Conference on Natural Language Processing* (pp. 332–338). Seoul: Language Research Institute, Seoul National University.

- Gasser, M. (1989). Robust lexical selection in parsing and generation. *Annual Conference of the Cognitive Science Society*, *11*, 82–89.

- Gasser, M., & Dyer, M. G. (1988). Sequencing in a connectionist model of language processing. *International Conference on Computational Linguistics*, *12*, 185–190.

- Gasser, M. (1987). Memory organization in the bilingual/second language learner: a computational approach. *Proceedings of the Eastern States Conference on Linguistics 1986.*

- Gasser, M., & Dyer, M. G. (1986). *Speak of the devil*: representing deictic and speech act knowledge in an integrated lexical memory. *Annual Conference of the Cognitive Science Society*, *8*, 388–398.

Book Chapters

- Gasser, M., Sethuraman, N., & Hockema. S. (2010). Iconicity in expressives: an empirical investigation. In John Newman & Sally Rice (Eds.), *Empirical and experimental methods in cognitive/functional research.* Stanford, CA: Center for the Study of Language and Information Publications.

- Gasser, M. & Colunga, E. (2003). Pattern learning in infants and neural networks. In P. Quinlan (Ed.), *Connectionist models of development*, pp. 233-255. Hove, UK: Psychology Press.

- Gasser, M. (2002). Computational models of language learning. In D. Chalmers, P. Culicover, R. French, R. Goldstone, & L. Nadel (Eds.), *Encyclopedia of Cognitive Science*. London: Nature Publishing Group.

- Colunga, E., Gasser, M. & Smith, L. B. (2002). Attention to different cues in noun learning: the effect of English vs. Spanish mass/count syntax. In B. Skarabela, S. Fish, & A. H-J. Do (Eds.), *Proceedings of the 26th Annual Boston University Conference on Language Development*. Somerville MA: Cascadilla Press.

- Gasser, M., & Colunga, E., & Smith, L. B. (2001). Developing relations. In Emile van der Zee & Urpo Nikanne (Eds.), *Cognitive interfaces: Constraints on linking cognitive information*, pp. 185–214. Oxford: Oxford University Press.

- Eck, D., Gasser, M, & Port, R. F. (1999). Dynamics and embodiment in beat induction. In P. Desain & L. Windsor (Eds.), *Rhythm perception and production*. Liss, NL: Swets and Zeitlinger.

- Smith, L. B., Gasser, M., & Sandhofer, C. (1997). Learning to talk about the properties of objects: a network model of the development of dimensions. In R. Goldstone, D. Medin, & P. G. Schyns (Eds.), *Mechanisms of perceptual learning*, *Psychology of Learning and Motivation* series, pp. 220–255. San Diego: Academic Press.

- Gasser, M. (1997). Transfer in a connectionist model of the acquisition of morphology. In H. Baayen & R. Schroeder (Eds.), *Yearbook of morphology, 1996*, pp. 97–116. Dordrecht: Foris.

- Gasser, M. (1995). Relating comprehension and production in the acquisition of morphology. In C. Koster & F. Wijnen (Eds.), *Proceedings of the Groningen Assembly on Language Acquisition, 1995*, pp. 197–206. Groningen: Centre for Language and Cognition.

- Port, R. F., Cummins, F., and Gasser, M. (1995). A dynamic approach to rhythm in language: toward a temporal phonology. In B. Luka and B. Need (Eds.), *Proceedings of the Chicago Linguistics Society. 1995* (Department of Linguistics, University of Chicago), pp. 375–397.

- Lee, C-D., & Gasser, M. (1992). Where do underlying representations come from? a connectionist approach to the acquisition of phonological rules. In J. Dinsmore (Ed.), *The symbolic and connectionist paradigms: Bridging the gap*, pp. 179–207. Hillsdale, NJ: Lawrence Erlbaum.

- Gasser, M. (1983). Topic continuity in written Amharic narrative. In T. Givón (Ed.), *Topic continuity in discourse: a quantitative cross-language study* (pp. 99–139). Amsterdam: John Benjamins.

Others

- Mix, K., Smith, L. B., & Gasser, M. (Eds). (2010). *Thinking through space: spatial foundations of language and cognition*, Oxford, UK: Oxford University Press.

- Gasser, M. (2006). *Herramientas computacionales para el fortalecimiento de los idiomas mayas: una propuesta.* `http://www.cs.indiana.edu/~gasser/Archive/almg_prop2.pdf`.

- Gasser, M. *How language works: the cognitive science of linguistics.* (2003-2006). Online book. `http://www.indiana.edu/~hlw/`.

- Gasser, M., & Colunga, E. (1998). Where do relations come from? Indiana University Cognitive Science Program, Technical Report #221. Bloomington, IN.

- Gasser, M. & Colunga, E. (1997). *Playpen: toward an architecture for modeling the development of spatial cognition.* Indiana University Cognitive Science Program, Technical Report #195. Bloomington, IN.

- Smith, L. B. & Gasser, M. (1997). Toward the reality of learning: a review of Gleitman & Landau's *The Acquisition of the Lexicon. Language*, *73*, 160–162 [book review].

- Gasser, M. (1993). *Learning words in time: Towards a modular connectionist account of the acquisition of receptive morphology.* (Report 384). Bloomington, IN: Indiana University, Computer Science Department.

- Gasser, M. (1991). Learning to recognize and produce words: Towards a connectionist model. *Center for Research in Language Newsletter*, November, 1991.

- Gasser, M. (1990). Learning lexical entries with distributed structure [invited review article]. *Neural Network Review*, *4*, 71-2.
- Gasser, M. (1989). Towards a connectionist model of the perception and production of rhythmic patterns. *Proceedings of the Second International Workshop on AI and Music* (pp. 99–101).
- Gasser, M. (1988). *A connectionist model of sentence generation in a first and second language* (Report UCLA-AI-88-13). Los Angeles: University of California, Los Angeles, Computer Science Department [Ph.D. dissertation].
- Gasser, M. (1987). Dynamic lexical memory. *LACUS Forum*, *13*, 421–431.
- Gasser, M., & Dyer, M. G. (1985). *Second language production: Coping with gaps in linguistic knowledge* (Report UCLA-AI-85-18). Los Angeles: University of California, Los Angeles, Computer Science Department.
- Rossi, L. D., & Gasser, M. (1983). *Academic English.* Englewood-Cliffs, NJ: Prentice-Hall.

Unpublished Conference Presentations or Posters

Morphological processing of Afaan Oromoo. *Annual Conference of the Oromo Studies Association*, *24*, Washington, DC, August, 2010.

Pattern discovery and compression in finite state transducers (poster, with G. Schrementi (first author)). *Annual Conference of the Cognitive Science Society*, *31*, Amsterdam, August, 2009.

Morphological analysis and generation in computer-assisted teaching of indigenous languages. *First Biennial Symposium on Teaching Indigenous Languages of Latin America*, Bloomington, IN, August, 2008.

Finding Agents and Patients (poster, with S. Shayan (first author) and L. Gershkoff). *32nd Boston University Conference on Language Development*, Boston, MA, November, 2007.

Agent and Patient revisited. (poster, with S. Shayan (first author) and L. Gershkoff). *29th Meeting of the Cognitive Science Society*, Nashville, TN, August, 2007.

Informatics and the future of indigenous languages. *Annual Meeting of the American Comparative Literature Association*, Seminar on "New Literacies in Indigenous Languages: the Role of Mass Media in Mexico, Central and South America". Puebla, Mexico, April, 2007.

How do children learn Agent and Patient roles? (poster, with S. Shayan (first author) and L. Gershkoff). *Biennial Meeting of the Society for Research in Child Development* Boston, MA, April, 2007.

La traducción automática y las lenguas indígenas *IX Encuentro Internacional de Lingüística en el Noroeste*, Hermosillo, Sonora, Mexico, November, 2006.

Iconicity in expressives: an empirical approach (with N. Sethuraman and S. Hockema). *VIII Encuentro Internacional de Lingüística en el Noroeste*, Hermosillo, Sonora, Mexico, November, 2004.

Attention to different cues in noun learning: the effect of English vs. Spanish mass/count syntax (with E. Colunga). *VIII Encuentro Internacional de Lingüística en el Noroeste*, Hermosillo, Sonora, Mexico, November, 2004.

An artificial life approach to the teaching of global economics. *XII World Congress of Comparative Education Societies*, Havana, Cuba, October, 2004.

Iconicidad y arbitrariedad: una nueva perspectiva. *Lingüística 2003*, Havana, Cuba, November, 2003.

How communicative pressure affects phonology: modelling sound change in a population of communicators. (with T. Laine). *Eighth International Cognitive Linguistics Conference*, Logroño, Spain, July, 2003.

Gesture Language Game: simulating the emergence of linguistic signs (with H. Oda). *Eighth International Cognitive Linguistics Conference*, Logroño, Spain, July, 2003.

Gasser, M. Where compositionality comes from. *Eighth International Cognitive Linguistics Conference*, Logroño, Spain, July, 2003.

Where does compositionality come from? *First Annual Summer Inter-disciplinary Conference*, Squamish, BC, Canada, July, 2002.

Language acquisition and symbolic cognition: the beginnings of compositionality (with S. Hockema and E. Colunga). *38th Annual Meeting of the Chicago Linguistic Society*, Chicago, April, 2002.

Children's novel noun generalizations: the effect of English vs. Spanish mass/count syntax (with E. Colunga and K. Burns). *64th Biennial Meeting of the Society for Research on Child Development*, Minneapolis, MN, April, 2001.

Developmental patterns from statistical regularities: A connectionist model of the shape bias (with Larissa K. Samuelson). *62nd Biennial Conference of the Society for Research in Child Development*, Washington, DC, April, 1997.

A neural network model of developmental changes in naming behavior (with Linda B. Smith). *60th Biennial Conference of the Society for Research in Child Development*, New Orleans, March, 1993.

Why are nominal terms learned faster than dimensional adjectives? (with Linda B. Smith). *17th Annual Boston University Conference on Language Development*, Boston, October, 1992.

Reduplication and simple recurrent networks. *First Midwest Connectfest*, Bloomington, IN, November, 1990.

Learning a phonological process without an explicit rule (with C. D. Lee). *Second Midwest Conference on Artificial Intelligence and Cognitive Science*, Carbondale, IL, March, 1990.

The induction of a relational rule by a network (with Linda B. Smith). *Annual Meeting of the Psychonomic Society*, Atlanta, November, 1989.

Literal and figurative meaning in a hierarchical linguistic memory. *Conference on the Interaction of Form and Function in Language*, Davis, CA, January, 1987.

Representing pragmatic knowledge in lexical memory. *Southern California Conference on Artificial Intelligence*, San Diego, April, 1986.

A computational model of narrative production in a second language. *Sixth Second Language Research Forum*, Los Angeles, February, 1985.

Towards a computer model of an interlanguage system. *Seventh World Congress of Applied Linguistics*, Brussels, August, 1984.

Towards a computer model of second language production. *Annual Meeting of the American Association for Applied Linguistics*, Minneapolis, December, 1983.

Towards a computer model of second language listening comprehension. *Fifth Second Language Research Forum*, Los Angeles, November, 1983.

Amharic *-m* and *-ss*: Morphology and the given-new strategy of comprehension. *Fourteenth Conference on African Linguistics*, Madison, WI, April, 1983.

Some factors in memory for second language vocabulary. *Fourth Second Language Research Forum*, Los Angeles, April, 1982.

Discourse functions in introductory physics texts (with L. D. Rossi). *Teaching English to Speakers of Other Languages, Summer Meeting*, Los Angeles, July, 1979.

Workshop and Panel Participation

Computer science research, funding in the US, and WSIS goals. Parallel event of the *World Summit on Information Society* on the Role of Computer Science and Engineering Professions in Helping to Realize the WSIS Benchmarks, Tunis, Tunisia, November, 2005.

How words get arbitrary: computational and linguistic considerations. Symposium on How Words Get Special, Biennial Meeting of the Society for Research on Child Development, Atlanta, GA, April, 2005.

Space in English and Tzeltal: implications for language development. Workshop on Spatial Foundations of Cognition and Language, Bloomington, IN, October, 2003.

Where do symbols come from? Symposium on Interactions Between Cognition and Language, Biennial Meeting of the Society for Research on Child Development, Tampa, FL, April, 2003.

A methods-oriented curriculum for a cognitive science degree, Workshop on Graduate Education in Cognitive Science and Issues of Cross-Disciplinary Communication. *Twenty-First Annual Conference of the Cognitive Science Society*, Vancouver, August, 1999.

An architecture for the learning of perceptually grounded word meaning (with Eliana Colunga). *Workshop on Grounding Word Meaning*, Madison, WI, July, 1998.

Linguistic relativity and word acquisition (with Eliana Colunga). Workshop on Neural Models of Conceptual Learning. *Neural Information Processing Systems Post-Conference Workshops*, Breckenridge, CO, December, 1997.

Symposium on Space and Language. *Seventh Midwest Artificial Intelligence and Cognitive Science Conference*, April, 1996.

Modularity in connectionist language acquisition: What, why, how. Workshop on Statistical and Neural Network Approaches to Natural Language Processing. *Neural Information Processing Systems Post-Conference Workshops*, Vail, CO, December, 1994.

A connectionist approach to the acquisition of phonological representations for word recognition and production. Symposium on Connectionist Approaches to Language Acquisition, *Sixth International Congress for the Study of Child Language*, Trieste, Italy, July, 1993. Submitted paper.

Grounding structure. Workshop on Approaches to Symbol Grounding, *Neural Information Processing Systems Post-Conference Workshops*, Vail, CO, December, 1992. Presentation at above workshop.

Symposium on Development of Similarity, *14th Annual Conference of the Cognitive Science Society*, Bloomington, IN, August, 1992. Participant.

Learning syllable representations in sequential connectionist networks. *Workshop on the Cognitive Science of Natural Language Processing*, Dublin, March, 1992. Submitted paper.

Phonological performance and sequential networks. Panel on Connectionism and Phonology. *Second Annual Midwest Connectfest*, Columbus, OH, November, 1991. Invited paper.

Panel on Technologies and Human Evolution, *Future (tense?): The sense of place in a changing world* (The Indiana Humanities Council 17th Annual Conference). Indianapolis, November, 1989. Participant.

Panel on Parallel Processing Models, *Second International Workshop on AI and Music*. Detroit, August, 1989. Participant.

Invited Lectures

A place for rule-based translation. IT Doctoral Program, Addis Ababa University. Addis Ababa, Ethiopia, October, 2011.

La educación y la salud de las lenguas. Fundación Yvy Marãe'ỹ. San Lorenzo, Paraguay, July, 2011.

La traducción automática y a la educación bilingüe paraguaya: una propuesta. Fundación Yvy Marãe'ỹ. San Lorenzo, Paraguay, June, 2011.

La gramática de dependencias y la traducción automática. Facultad de Ingeniería, Unversidad de la República, Montevideo, Uruguay, June, 2011.

The Linguistic Digital Divide and machine translation. Faculty of Education, Suez Canal University, Ismailia, Egypt, May, 2011.

Finite state morphology for Ethiopian Semitic languages. Invited keynote address. *Workshop on Computational Approaches to Semitic Languages, Conference of the European Chapter of the Association for Computational Linguistics* . Athens, Greece, March, 2009.

Strategies towards the development of LTs and LRs for Ethiopian languages. *International Workshop on Research and Development for Language Technology Resources in Ethiopian Languages.* Addis Ababa, Ethiopia, November, 2007.

Computational linguistics and Mayan languages. Minority Languages and Cultures Project, Center for Latin American and Caribbean Studies. Bloomington, Indiana, November 2007.

The Linguistic Digital Divide and machine translation. Indiana University Workshop in Political Theory and Policy Analysis Colloquium. Bloomington, Indiana, February, 2007.

Natural language, machine translation, and the democratization of knowledge. Indiana University School of Informatics Colloquium. Bloomington, Indiana, March, 2006.

Developing language perception and production: some connectionist perspectives. Connectionist and Dynamic Systems Approaches to Development, Iowa City, Iowa, June, 2005.

Language, competition, and arbitrariness. Workshop on Bootstrapping in Language Acquisition: Computation, Psychological, and Linguistic Aspects, Bloomington, Indiana, April, 2003.

Becoming symbolic. Cognitive Science Brown Bag Lecture, Ohio State University, Columbus, OH, January, 2003.

Becoming symbolic: towards a connectionist model of the acquisition of grammar. Cognitive Science Colloquium, Southern Illinois University, Carbondale, IL, October, 2002.

Where does compositionality come from? Annual Workshop on Mechanisms of Brain and Mind. Tateshina, Japan, August, 2002.

Micro-relations. Computer Science Department Colloquium, Indiana University, December, 2000.

Learning regularities in sequences: variables or relational correlations? Carleton University Cognitive Science Distinguished Lecture Series, Ottawa, Ontario, January, 2000.

Babies, variables, and connectionist networks. Midwest Artificial Intelligence and Cognitive Science Conference, Bloomington, IN, March, 1999.

Representation, generalization, and modularity in connectionist models of language. University of Michigan Linguistics Department Colloquium, December, 1998.

An architecture for the development of spatial relations. Electrotechnical Laboratory, Tsukuba, Japan, July, 1997.

An architecture for the development of spatial relations. Chukyo University, Japan, July, 1997.

Modeling language acquisition: Horizontal and vertical approaches. Tokyo University, Japan, June, 1996.

Modeling language acquisition: Horizontal and vertical approaches. Utsunomiya University, Japan, June, 1996.

Rhythm in language and coupled oscillators. Tokyo University, Japan, June, 1996.

Connectionism, modularity, and language acquisition. Tokai University, Japan, December, 1993.

Connectionism, modularity, and language acquisition. Department of General Psychology, Eötvös Loránd University, Budapest, July, 1993.

Towards a connectionist approach to language acquisition. Austrian Research Center for Artificial Intelligence, Vienna, July, 1993.

The subsymbolic structure of natural language. Computer Science Department Colloquium. Indiana University, Bloomington, IN, April, 1993.

Learning morphology in time. Cognitive Science/Artificial Intelligence Group, Beckman Institute, University of Illinois, Urbana-Champaign, April, 1993.

Learning words in time. Cognitive Science Colloquium, Indiana University, Bloomington, IN, December, 1992.

Learning to recognize and produce words. International Computer Science Institute, Berkeley, CA, November, 1992.

Learning to recognize and produce words. Psychology Department Colloquium, University of California, Davis, CA, November, 1992.

Learning to recognize and produce words. Linguistics Department Colloquium, University of Oregon, Eugene, OR, November, 1992.

Subsymbolic semantics. Central Laboratories, NEC Corporation, Kawasaki, Japan, May, 1992.

Connectionism and language acquisition. Linguistics Department Colloquium, San Diego State University, San Diego, May, 1991.

Word recognition and production: The role of phonological regularity. Linguistics Department Colloquium, University of California, San Diego, La Jolla, February, 1991.

Comparison in discourse processing. Linguistics Department Colloquium, University of California, San Diego. La Jolla, February, 1991.

Word recognition and production: The role of prediction and short-term memory. Linguistics Department Colloquium, Indiana University. Bloomington, IN, November, 1990.

Networks that learn phonology. Institute for the Study of Human Capabilities, Indiana University. Bloomington, IN, March, 1990.

Connectionism and expert systems. Indiana Corporation for Science and Technology, Software Engineering group. Indianapolis, March, 1990.

Connectionism and natural language processing. Central Laboratories, NEC Corporation, Kawasaki, Japan, July, 1989.

Cognitive modeling and second language acquisition theory. *Sixth Second Language Research Forum.* Los Angeles, February, 1985.

Main courses taught

Undergraduate, Indiana University

- Computer Science B351/Q351: Introduction to Artificial Intelligence and Computer Simulation
- Cognitive Science Q260/Q320: Computation in Cognitive Science
- Cognitive Science Q450/Computer Science B490: How Language Works

- Linguistics L103: Introduction to the Study of Language
- Linguistics L490: The Structure of Amharic
- COAS E105: Rhythm and Cognition

Graduate, Indiana University

- Computer Science B551: Artificial Intelligence
- Computer Science B553: Neural and Genetic Approaches to Artificial Intelligence
- Computer Science B651: Natural Language Processing
- Computer Science B659: Multilingual Natural Language Processing
- Cognitive Science Q530: Programming Methods for Cognitive Science
- Linguistics L503: Survey of Linguistics
- Linguistics L645: Computational Linguistics

Graduate, Addis Ababa University

- CIT836: Machine Translation

Software

Teaching

- Smarts: Studying adaptation in an artificial world.
  `http://www.cs.indiana.edu/~gasser/Smarts/`
- Biomorph: Neural and genetic algorithms and artificial life.
  `http://www.cs.indiana.edu/~gasser/Software/Biomorph/`

Natural Language Processing

- L3XDG 0.9: implementation of Extensible Dependency Grammar for sentence analysis and translation.
  `http://www.cs.indiana.edu/~gasser/Research/software.html`
- HornMorpho 2.3: morphological analysis and generation of Amharic and Oromo verbs and nouns and Tigrinya verbs.
  `http://www.cs.indiana.edu/~gasser/Research/software.html`
- AntiMorfo 1.2: morphological analysis and generation of Quechua verbs and nouns and Spanish verbs.
  `http://www.cs.indiana.edu/~gasser/Research/software.html`
- MorfoMelayu 0.9.6: morphological analysis of Malay words.
  `http://www.cs.indiana.edu/~gasser/Research/software.html`

Grants

"Training Program in Integrative Developmental Process" (PI: Linda B. Smith), NIH, 2005–09

"A Cross-Linguistic Study of Nominal Category Formation" (co-PI, PI: Linda B. Smith), NIH, 9/1/03–8/31/08, $1,316,875

"Learning Nouns in English and Japanese" (co-PI, PI: Linda B. Smith), NIH, 9/1/99–5/31/03, $435,018

"Enhancing Research and Education in Computational Intelligence" (co-PI, PI: David Leake), US Dept. of Education, 8/15/98–8/14/02, $380,485

"Training Program in Integrative Developmental Process" (PI: Linda B. Smith), NIH, 1/00–12/04, $1,459,674

"Getting something from nothing: Dumb processes creating domain-specific learning," Multidisciplinary Ventures Fund, Indiana University, with Linda B. Smith, 1997-1998, $2,330

"Modeling the development of dimensions and sameness," Multidisciplinary Ventures Fund, Indiana University, with Linda B. Smith, 1990-1991, $1,750

Professional Activities

Director of Graduate Studies, Cognitive Science Program, Indiana University (1998–)

Director of Graduate Admissions and Awards, Computer Science Program, School of Informatics and Computing, Indiana University (Fall 2009–Fall 2010)

Acting Chair, COAS Undergraduate Education Committee, Indiana University (Fall 2002)

Acting Assistant Director, Cognitive Science Program, Indiana University (1995)

Chair, Graduate Admissions Committee, Computer Science Department, Indiana University (1993–2001)

Member, Steering Committee, Cognitive Science Program, Indiana University (1989–)

Member, Undergraduate Education Committee, College of Arts and Sciences, Indiana University (2000–2004)

Member, African Studies Faculty, Indiana University (1994–)

Member, Center for Latin American and Caribbean Studies Faculty, Indiana University (2007–)

Member, Human Subjects Committee, Indiana University (1998–2000)

Member, Advisory Board, Leadership, Ethics, and Social Action minor, Indiana University (2003–2009)

Member, Globalization Committee, School of Informatics, Indiana University (2005–2008)

Information Officer, Association for Computational Linguistics Special Interest Group on Computational Approaches to Semitic Languages (2010–)

Advisory Board Member, Macmillan *Encyclopedia of Cognitive Science* (1999)

Co-organizer, Workshop on "Scholar Activism in the Global Justice Movement," US Social Forum, Detroit, June, 2010

Co-organizer, Workshop on "Linguistic Rights in the Americas," Americas Social Forum, Guatemala City, Guatemala, October, 2008

Co-organizer, Workshop on "Scholar Activism and the Social Forums," Midwest Social Forum, Milwaukee, WI, June, 2006

Co-organizer, Workshop on "Teaching Cognitive Science," Bloomington, IN, June, 2006

Member, Program Committee, *Annual Meeting of the Association for Computational Linguistics 2010, System Demonstrations*

Member, Program Committee, *First Workshop on Language Technologies for African Languages* (2009)

Member, Program Committee, *Sixth Midwest Computational Linguistics Colloquium* (2009)

Member, Program Committee, *Fifth International Conference on Development and Learning* (2006)

Co-organizer, Workshop on "Breaking Down the Ivory Tower: the University in the Creation of Another World," World Social Forum V, Porto Alegre, Brazil, January, 2005

Co-organizer, Workshop on "Spatial Foundations of Cognition and Language," Bloomington, IN, October, 2003

Co-organizer, Workshop on "Grounding Word Meaning," *Fifteenth National Conference on Artificial Intelligence*, Madison, WI, July, 1998

Program Chair, *Seventh Midwest Artificial Intelligence and and Cognitive Science Conference* (1996)

Member, Program Committee, *Sixth Midwest Artificial Intelligence and Cognitive Science Conference* (1995)

Member, Program Committee, "First Workshop on Computational Phonology" (1994)

Co-organizer, Symposium on "Grounding, Situatedness, and Meaning," *15th Annual Conference of the Cognitive Science Society*, Boulder, CO, June, 1993

Co-organizer, *Fourth Midwest Connectfest* (1993)

Member, Program Committee, *14th Annual Conference of the Cognitive Science Society* (1992)

Co-organizer, Workshop on "Approaches to Symbol Grounding," *Neural Information Processing Systems Post-Conference Workshops*, Vail, CO, December, 1992

Member, Program Committee, *Third Midwest Artificial Intelligence and Cognitive Science Conference* (1992)

Co-organizer, *First Midwest Connectfest* (1990)

Member of grant panel: National Endowment for the Humanities, Division of Preservation and Access, Linguistics Panel, October 10, 2003

Reviewer: *Adaptive Behavior*; *Annual Meeting of the Cognitive Science Society* (14, 15, 16, 20, 21, 22, 23, 24, 25, 26, 27); Australian Research Council; *Annual Meeting of the Association for Computational Linguistics, Systems Demo track*; *Behavior Research Methods: Instruments and Computers*; *Behavioral and Brain Sciences*; *British Journal of Developmental Psychology*; *Cognitive Science*; *Computational Linguistics*; *Computer Surveys*; *Conference on Conceptual Structure, Discourse, and Language*; *Conference on Computational Psycholinguistics*; *Connection Science*; *Connectionist approaches to analogy, metaphor and case-based reasoning* (ed. K. Holyoak & J. Barnden); Indiana University Press; *International Conference on Development and Learning* (5); *Issues in Applied Linguistics*; *Journal of Child Language*; *Journal of Memory and Language*; Lawrence Erlbaum Associates; *Language Learning*; *Language and Cognitive Processes*; *Linguistics*; *Linguistics and Philosophy*; *Machine Learning*; National Science Foundation; *2008 Midwest Computational Linguistics Colloquium*; *National Conference on Artificial Intelligence* (21); *Natural Language Engineering*; *Neural Information Processing Systems* (4, 8); *Neural Network Review*; *North American Summer School in Logic, Language and Computation*; *Psychological Review*; *Stud-*

ies in Second Language Acquisition; *Trends in Cognitive Science*; *First Workshop on Language Technologies for African Languages*

Member: Association for the Advancement of Artificial Intelligence, Association for Computational Linguistics

Doctorates Supervised

Chan-Do Lee, *Learning to perceive and produce words in connectionist networks*, Indiana University, August 1991.

Lisa Meeden, *Towards planning: Incremental investigations into robot control*, Indiana University, August 1994.

J. Devin McAuley (co-advisor), *Perception of time as phase: Toward an adaptive-oscillator model of rhythmic pattern processing*, Indiana University, August 1995.

Douglas Blank, *Learning to see analogies: a connectionist exploration*, Indiana University, November 1997.

Hiromi Oda, *An embodied semantic mechanism for mimetic words in Japanese*, Indiana University, May 2000.

Douglas Eck, *Meter through synchrony: Processing rhythmical patterns with relaxation oscillators*, Indiana University, May 2000.

Kyle Wagner, *Simulation models of evolution: Communication and cooperation*, Indiana University, August 2000.

Eliana Colunga (co-advisor), *A connectionist account of the object-substance distinction in early noun learning*, Indiana University, December 2001.

Peter Drake, *The origins of number: A computational account*, Indiana University, August 2002.

Rutvik Desai, *Modeling emergence in language acquisition*, Indiana University, January 2003.

Stephen Hockema (co-advisor), *Perception as prediction: Ramifications on the acquisition and representation of dimensions*, Indiana University, May 2004.

Jun Luo (co-advisor), *The dynamics of permanence: Beyond A-not-B*, Indiana University, December 2004.

Brian Riordan, *Comparing semantic space models using child-directed speech*, Indiana University, March 2007.

David Landy (co-advisor), *Formal notations as diagrams of abstract structure*, Indiana University, August 2007.

Shakila Shayan (co-advisor), *Emergence of roles in English canonical transitive construction*, Indiana University, May 2008.

Joshua Goldberg (co-advisor), *When, not where: a dynamical field theory of infant gaze*, Indiana University, January 2009.

Natalya Panteleyeva (co-advisor), *Statistical methods of latent structure discovery in child-directed speech*, Indiana University, January 2011.

Giancarlo Schrementi, *Language in the balance: Factors in the emergence of compositional communication*, Indiana University, June 2011.

Natural Language Competence

Good to excellent: Amharic, German, Spanish
Fair: French, Japanese, Tigrinya
Significant formal knowledge: Portuguese, Mandarin Chinese, Oromo, Quechua, Swahili, Guarani, K'iche'