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## EDUCATION:

- 2000–2003 **Ph.D.**, University of Louisiana at Lafayette, Lafayette, LA, U.S.A.  
Computer Science, December 2003, Advisor: Dr. Anthony S. Maida
- 1998–2000 **M.Sc.**, University of Louisiana at Lafayette, Lafayette, LA, U.S.A.  
Computer Science, GPA 3.77
- 1994–1998 **B.Sc.**, İstanbul Teknik Üniversitesi, İstanbul, Turkey.  
Electronics and Telecommunications.

## RESEARCH EXPERIENCE:

- 10/2007–present **Postdoctoral Fellow** at Emory University, Atlanta, GA, U.S.A.  
Dept. of Biology, Mentor: Astrid A. Prinz.  
Generated and analyzed database of 20 million pyloric neuronal network models from the lobster stomatogastric ganglion to find best calcium sensor parameters for activity-dependent homeostatic regulation. Currently working on creating a novel model for *Drosophila* motoneurons.
- 01/2004–09/2007 **Postdoctoral Fellow** at Emory University, Atlanta, GA, U.S.A.  
Dept. of Biology, Mentor: Dieter Jaeger.  
Used a biologically-realistic multicompartmental model of the rat globus pallidus neuron to generate and analyze a database of about 100,000 models, for finding neuron models that match physiological experiments. Also, created the Pandora Matlab toolbox for managing experimental and simulated neural data in databases.
- 09/2000–12/2003 **Doctoral Student** at University of Louisiana at Lafayette, Lafayette, LA.  
Center for Advanced Computer Studies, Mentor: Dr. Anthony S. Maida  
Created a simulation environment for analyzing the behavior of spiking neural networks for modeling signal behavior in brain-like neuronal networks.
- 06/2003–08/2003 **Research Assistant** at the University of Louisiana at Lafayette, Lafayette, LA, U.S.A.  
Center for Advanced Computer Studies.  
Designed a software environment and led a group of software developers to implement a JSP front-end for a customizable metasearch engine.
- 01/1999–08/2000 **Research Assistant** at the University of Louisiana at Lafayette, Lafayette, LA.  
Dept. Philosophy, Supervisor: István S. N. Berkeley  
Created the ANNAP software for artificial neural network research for addressing questions about the philosophy of mind.

## TEACHING EXPERIENCE:

- 06/2009–07/2009 **Tutor**, Okinawa Computational Neuroscience Course, Okinawa Institute of Science and Technology, Okinawa, Japan. My duties as a tutor was to mentor the class project developed by each of my three to four students, who are selected among international undergraduate, graduate or postdoctoral candidates by merit for this highly competitive course. It was also my duty to prepare and deliver tutorials on several different subjects, such as on introducing different simulation or analysis software packages for computational neuroscience, on giving direction in designing a computational modeling project to completion, and on proper ways of documenting research progress.

- 06/2008–present **Mentor**, Emory University. Supervised and collaborated with an undergraduate student, Logesh Dharmar, to build a novel neuron model for *drosophila* motoneurons from voltage-clamp data. Logesh was awarded a 10-week travel grant in 2010 to perform research at our international collaborator at the University of Manchester in Manchester, United Kingdom.
- 02/2010 **Guest Lecturer**, Emory University, Computational Neuroscience course taught to the seniors of the undergraduate Biology department and to graduate students in the Neuroscience Graduate Program. I taught the section of the course on parameter search methods for biological neuron models with large parameter spaces.
- 02/2009 **Guest Lecturer**, Emory University, Neuroscience Live class in the Neuroscience and Behavioral Biology program. Taught a class on database analysis of modeling and recorded electrophysiological data.
- 06/2008–07/2008 Attended the Summer Undergraduate Research Program (SURE) **Mentoring Seminar** at Emory University that allows undergraduate students to conduct supervised research with a faculty mentor.
- 03/2006 **Guest Lecturer**, Emory University, Computational Neuroscience class in the Neuroscience and Behavioral Biology program. Taught a class on computer simulation of biologically realistic single neuron models with the GENESIS neural simulator.
- 08/2001–12/2001 **Instructor**, University of Louisiana at Lafayette, Lafayette, LA. Designed and taught a course on advanced data structures and object oriented programming in C++.
- 01/2001–05/2001 **Teaching Assistant**, University of Louisiana at Lafayette, Lafayette, LA. Created and graded assignments and a final project in a graduate course on operating system theory.

#### FELLOWSHIPS AND AWARDS:

- 2004–10 Postdoctoral Fellow of Emory University.
- 2010 Travel Fellowship from the Journal of Experimental Biology in the United Kingdom.
- 2009–10 Tutor at the Okinawa Computational Neuroscience Course in Japan.
- 2009 Travel fellowship, Organization for Computational Neurosciences conference.
- 2005 Travel fellowship, Workshop for Young Researchers in Mathematical Biology at Ohio State Univ.
- 2003 Travel fellowship, International Conference on Cognitive and Neural Systems at Boston Univ.
- 2000–03 University Doctoral Fellowship from the University of Louisiana at Lafayette.

#### ADDITIONAL ACTIVITIES, MEMBERSHIPS AND HONORS:

- 2009–10 Member of the Emory University Postdoctoral Association Executive Committee.  
Chair of the Emory University International Postdoctoral Fellows Association.
- 2010 Judge, 8th DSAC Student Research Symposium, Emory Univ.
- 2009 Local organizing committee, Southeast Nerve Net (SENN) conference.  
Local organizing committee, International Joint Conference on Neural Networks (IJCNN).  
Member of review committee of Neuroinformatics journal.
- 2006–09 Member of review committee of the Computational Neuroscience Meeting (CNS).
- 2006–09 Member of review committee of the Neurocomputing journal.
- 2004–09 Member of the Society for Neuroscience.
- 2007 Workshop organizer, Comp. Neurosci. conf. on Electrophysiology Databases and their Analysis.

- 2006 Member of technical selection committee for high-performance computing cluster at Emory University.
- 2002–03 Secretary, President of local IEEE student chapter at the University of Louisiana at Lafayette.
- 1997–98 President of computer club student organization at the Technical University of Istanbul.

## PUBLICATIONS:

### Peer-reviewed Journal Papers

- JR Edgerton, J Hanson, **Cengiz Günay**, and D Jaeger (2010). "Dendritic sodium channels regulate network integration in globus pallidus neurons: A modeling study" *J Neurosci.* 30(45):15146–59.
- Cengiz Günay**, Astrid A. Prinz (2010). "Model calcium sensors for network homeostasis: Sensor and readout parameter analysis from a database of model neuronal networks." *J Neurosci.* 30: 1686–98 **Cited 2 times** by Nov, 2010.
- Cengiz Günay**, JR Edgerton, S Li, T Sangrey, AA Prinz and D Jaeger (2009). "Database Analysis of Simulated and Recorded Electrophysiological Datasets with PANDORA's Toolbox." *Neuroinformatics*, 7(2): 93-111.
- Cengiz Günay**, Jeremy R. Edgerton, and Dieter Jaeger (2008). "Channel density distributions explain dynamical variability between neurons: using a combined physiology and computer simulation database approach." *J Neurosci.* 28(30): 7476-7491 **Cited 12 times** by Nov, 2010.
- Cengiz Günay** and Anthony S. Maida (2006a). "A stochastic population approach to the problem of stable recruitment hierarchies in spiking neural networks." *Biological Cybernetics*, 94(1): 33–45.
- Cengiz Günay** and Anthony S. Maida (2006b). "Using temporal binding for hierarchical recruitment of conjunctive concepts overp delayed lines." *Neurocomputing*, 69(4–6): 317–367.
- István S. N. Berkeley and **Cengiz Günay** (2004). "Conducting banding analysis with trained networks of sigmoid units." *Connection Science*, Vol. 16, No. 2.
- Cengiz Günay** and Anthony S. Maida (2003). "Temporal binding as an inducer for connectionist recruitment learning over delayed lines." *Neural Networks*, Vol 16/5-6, pp. 593–600. **Cited 3 times** by Oct,2010.

### Theses and Book Chapters

- Joachim Diederich, **Cengiz Günay**, Jim Hogan (2010). *Recruitment Learning*. Studies in Computational Intelligence Series, Springer. Oct, 2010.
- Cengiz Günay**, Smolinski TG, Lytton WW, Morse TM, Gleeson P, Crook S, Steuber V, Silver A, Voicu H, Andrews P, Bokil H, Maniar H, Loader C, Mehta S, Kleinfeld D, Thomson D, Mitra PP, Aaron G, Fellous J-M (2008). Computational Intelligence in Electrophysiology: Trends and Open Problems. In: Smolinski TG, Milanova MG, Hassanién A-E (eds), Applications of Computational Intelligence in Biology: Current Trends and Open Problems, Chapter XIV, Springer, pp. 325–359.
- Cengiz Günay** (2003). "Hierarchical learning of conjunctive concepts in spiking neural networks." Ph.D. Dissertation under the supervision of Dr. Anthony S. Maida, Center for Advanced Computer Studies, University of Louisiana at Lafayette. Lafayette, LA 70504-4330, U.S.A.
- Cengiz Günay** (1998). "Symbolic analysis of electronic circuits." Bachelor's thesis under the supervision of Prof. Dr. Ahmet Dervişoğlu. Electrical and Electronics Department, Istanbul Technical University, Istanbul, Turkey.

### Peer-reviewed Conference Proceedings

- Cengiz Günay**, Astrid A. Prinz (2009). "Calcium sensor parameters and readout configurations for activity-dependent homeostatic regulation of pyloric network rhythms in the lobster stomatogastric ganglion." *BMC Neuroscience*, 10(Suppl 1):O4
- Cengiz Günay**, Astrid A. Prinz (2009). "Finding sensors for homeostasis of biological neuronal networks using artificial neural networks," 2009 International Joint Conference on Neural Networks, pp. 1025-1032.
- Cengiz Günay** and Dieter Jaeger (2008). "Database analysis and visualization of simulated and recorded electrophysiological data with PANDORA's Toolbox in Matlab" *BMC Neuroscience*, 9(Suppl 1): P82.

**Cengiz Günay**, Ryan M. Hooper, K. Richard Hammett and Astrid A. Prinz (2008). “Calcium sensor properties for activity-dependent homeostatic regulation of pyloric network rhythms in the lobster stomatogastric ganglion.” *BMC Neuroscience*, 9(Suppl 1):P42.

Hendrickson E, Edgerton J, **Cengiz Günay**, Schultheiss N, Jaeger D. “Converting a globus pallidus neuron model from 585 to 6 compartments using an evolutionary algorithm” *BMC Neuroscience*, 8(Suppl 2):P122.

**Cengiz Günay**, Jeremy R. Edgerton, and Dieter Jaeger (2007). “Characterizing the heterogeneity of globus pallidus neuron behavior by comparing a real neuron database with model databases of varying conductance parameters.” *BMC Neuroscience*, 8(Suppl 2): P123.

**Cengiz Günay**, Jeremy R. Edgerton, and Dieter Jaeger (2005). “Role of channel density variability in controlling neuronal dynamics: using physiological and modeling databases.” Oral presentation, 14th Annual Computational Neuroscience Meeting.

**Cengiz Günay** and Anthony S. Maida (2005). “A stochastic population approach to the problem of stable propagation of synchronized spike volleys.” Poster presentation, 14th Annual Computational Neuroscience Meeting.

**Cengiz Günay** and Anthony S. Maida (2003b). "Using Temporal Binding for Connectionist Recruitment Learning over Delayed Lines." *Proceedings of the International Joint Conference on Neural Networks*, vol. 1, pp. 224–229. Portland, Oregon, July 2003.

A. S. Maida, B. Rowland, **Cengiz Günay** (2001a). "Simulation of Planar I/F Networks with Delayed Connections", *Proceedings of the International Joint Conference on Neural Networks*, vol. 1, pp. 302–307, Washington, D.C., July 2001.

A. S. Maida, B. Rowland, **Cengiz Günay** (2001b). "Synchronized Firing in a Time-delayed Neural Network", *Proceedings of the 14th International Florida Artificial Intelligence Research Society Conference*, pp. 485–488. Key West, Florida, May 2001.

**Cengiz Günay** (2000). "Agent Architecture: Using Java Exceptions in a Nonstandard Way and an Object Oriented Approach to Evolution of Intelligence." In Loganantharaj, R., Palm, G., and Ali, M., editors, *Intelligent Problem Solving. Methodologies and Approaches*, vol. 1821 of *Lecture Notes in Artificial Intelligence*, pp. 717–722, Springer-Verlag, Berlin, 2000.

I. Berkeley, **Cengiz Günay**, and A. Maida (2000). "The value of value units: A flawed foray into non-monotonicity." In *Intelligent Engineering Systems Through Artificial Neural Networks*, vol. 10, edited by C. Dagli, A. Buczak, J. Ghosh, M. Embrechts, O. Ersoy and S. Kercel. New York, NY: Asme Press.

### Invited Talks

**Cengiz Günay** (2010). “Temporal binding and recruitment learning with a model of spiking neurons in cortical hierarchies” Seminar hosted by Dr. Tomoki Fukai at the BSI RIKEN, Tokyo, Japan on July 6th, 2010.

**Cengiz Günay**, Fred Sieling, Logesh Dharmar, Richard Marley, Wei-Hsiang Lin, Richard Baines and Astrid A Prinz (2010). “Modeling Drosophila motoneurons for characterizing functional effect of diereent Na channel splice variants” Oral presentation, Postdoctoral Fellow Research Symposium, School of Medicine, Emory University, Atlanta, Georgia, U.S.A., on May 20th, 2010.

**Cengiz Günay** (2010). “Modeling Drosophila motoneurons for characterizing functional effect of diereent Na channel splice variants” Seminar hosted by Dr. Sharon Crook at the School of Life Sciences, Arizona State University, Tempe, Arizona, U.S.A, on May 5th, 2010.

**Cengiz Günay** (2009). “Channel Density Distributions Explain Spiking Variability in the Globus Pallidus: A Combined Physiology and Computer Simulation Database Approach” Seminar hosted by Dr. Kenji Doya at the Neural Computation Unit, Okinawa Institute of Science and Technology, Okinawa, Japan, on July 6th, 2009.

**Cengiz Günay** (2009). “Channel density distributions explain dynamical variability between rat globus pallidus neurons: Using a combined physiology and computer simulation database approach.” Talk given in the Workshop on Automated Parameter Fitting for Compartmental Models organized by Dr. Erik De Schutter at the Eighteenth Annual Computational Neuroscience Meeting CNS\*2009, Berlin, Germany, July 18–23, 2009.

**Cengiz Günay**, Dawid Kurzyniec, Su Li, and Dieter Jaeger (2008). “Standardizing Storage of Recorded and Simulated Electrophysiological Data Using the Hierarchical Data Format (HDF5).” Talk given at the Interoperability Workshop

organized by Padraig Gleeson and Sharon Crook under the Seventeenth Annual Computational Neuroscience Meeting CNS\*2008 at Portland, Oregon, on July 23rd, 2008.

**Cengiz Günay** (2006). "Ion channel density distributions can explain the dynamical variability between globus pallidus neurons: A study of electrophysiological recording and simulation databases." Seminar, Biomed. Eng. Inst., Boğaziçi University, Istanbul, Turkey on Dec. 15, 2006.

**Cengiz Günay** and Anthony S. Maida (2002b). "Tolerating Delays and Preventing Crosstalk in Direct-Indirect Connection Topologies with Neural Networks Employing Recruitment Learning." Seminar, Dept. Electrical and Electronics Eng., Dokuz Eylül University, Buca, İzmir, Turkey. Aug 26, 2002.

Anthony Maida and **Cengiz Günay** (2001). "Recruitment Learning and Synchronized Firing in Neural Networks: A Faculty/Student Presentation." Seminar, Inst. Cogn. Sci. at Univ. Louisiana at Lafayette. Oct 19, 2001.

### Conference Talks and Abstracts

**Cengiz Günay** and Prinz, AA (2009). "Model calcium sensor parameters and readout configurations for activity-dependent homeostatic regulation of pyloric network rhythms in the lobster stomatogastric ganglion." Poster presented at the annual Society for Neuroscience meeting, Neuroscience 2009, in Chicago, IL on Oct. 17–21, 2009.

**Cengiz Günay** and Prinz, AA (2009). Calcium sensor parameters and readout configurations for activity-dependent homeostatic regulation of pyloric network rhythms in the lobster stomatogastric ganglion. Southeast Nerve Net Conference. Jacksonville, Florida. Mar. 28–28, 2009.

**Cengiz Günay**, Hooper R.M, Hammett K.R and Prinz A.A (2009). Calcium sensor properties for activity-dependent homeostatic regulation of pyloric network rhythms in the lobster stomatogastric ganglion. *Frontiers in Human Neuroscience*. Conference Abstract: 10th International Conference on Cognitive Neuroscience. Sep. 1–7, 2008. doi: 10.3389/conf.neuro.09.2009.01.355

**Cengiz Günay**, Ryan M. Hooper, K. Richard Hammett and Astrid A. Prinz (2008d). "Calcium sensor properties for activity-dependent homeostatic regulation of pyloric rhythms in the lobster stomatogastric ganglion." Poster presented at the annual Society for Neuroscience meeting, Neuroscience 2008, in Washington, DC on Nov. 15–19, 2008.

**Cengiz Günay**, Ryan M. Hooper, K. Richard Hammett and Astrid A. Prinz (2008c). "Activity-dependent homeostatic regulation of pyloric network rhythms in the lobster stomatogastric ganglion: Are calcium sensors sufficient?" Poster presented at the Atlanta Computational Neuroscience Workshop at the Georgia State University on April 8th, 2008.

**Cengiz Günay**, Ryan M. Hooper, K. Richard Hammett and Astrid A. Prinz (2008b). "Activity-dependent homeostatic regulation of pyloric network rhythms in the lobster stomatogastric ganglion: Are calcium sensors sufficient?" Talk given at the 2008 South East Nerve Net meeting at the Georgia State University on March 28th, 2008.

**Cengiz Günay**, Ryan M. Hooper, K. Richard Hammett and Astrid A. Prinz (2008a). "Activity-dependent homeostatic regulation of pyloric network rhythms in the lobster stomatogastric ganglion: Are calcium sensors sufficient?" Poster presented at the 10th Anniversary Colloquium of the Coulter Department of Biomedical Engineering and The Division of Cardiology at Georgia Tech and Emory University on March 6th, 2008.

**Cengiz Günay** and Dieter Jaeger (2007). Neural database analysis with Pandora's Toolbox in Matlab. Talk given at the electrophysiology Databases and Analysis Workshop of the 16th Annual Computational Neuroscience Meeting CNS\*2007 in Toronto, Canada, July 7th–12th, 2007.

**Cengiz Günay**, Jeremy R. Edgerton, and Dieter Jaeger (2007). "Interplay between maximal conductance and voltage half-activation parameters in a multicompartmental globus pallidus model neuron: comparison between two model databases." Poster presented at the Society for Neuroscience 37th Annual Meeting, San Diego, CA, Nov. 3–7, 2007.

**Cengiz Günay**, Jeremy R. Edgerton, and Dieter Jaeger (2005). "Role of channel density variability in controlling neural dynamics: using physiological and modeling databases." Poster presented at the Society for Neuroscience 35th Annual Meeting, Washington, DC, Oct. 2005.

**Cengiz Günay**, Jeremy R. Edgerton, and Dieter Jaeger (2005). "Using a brute-force database approach in the analysis of the high-dimensional parameter space of a globus pallidus neuron model." Poster presented at the 2005 Workshop for Young Researchers in Mathematical Biology, Mathematical Biosciences Institute, Ohio State University, Mar. 2005.

**Cengiz Günay**, Jeremy R. Edgerton, and Dieter Jaeger (2004). "Analysis of a Globus Pallidus Neuron Model Using a Brute-Force Conductance Parameter Search." Poster presented at the Society for Neuroscience 34th Annual Meeting, San Diego, CA, Oct. 2004.

**Cengiz Günay** and Anthony S. Maida (2003d). "A Robust Mechanism for Creating New Memories using Noisy Delays and Lateral Inhibition." Poster presented at the Seventh International Conference on Cognitive and Neural Systems, Boston University, MA, May 2003.

**Cengiz Günay** and Anthony S. Maida (2002a). "Tolerating Delays and Preventing Crosstalk in Direct-Indirect Connection Topologies with Neural Networks Employing Recruitment Learning." Poster presented at the Sixth International Conference on Cognitive and Neural Systems, Boston, MA, May 2002.

#### REFERENCES:

Dieter Jaeger (Postdoctoral adviser)  
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