

Jinyong Lee

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RESEARCH INTERESTS & APPLICATIONS Building **intelligent systems and relevant software**, based on biologically-inspired architecture and learning algorithms; the most recent research topic focusing on **human language processing**, with the areas of application including:

- **Natural Language Processing (NLP)**: Language learning/acquisition, semantics-based language comprehension (e.g., Apple's Siri)
- **General AI Application**: Machine learning (artificial neural network, supervised/unsupervised learning), Pattern recognition, Image processing (object detection, scene recognition), Distributed computing
- **Software System Development** (due to extensive programming experience): 2D/3D graphics, GUI design (enhanced with experience in eye-tracking experiments), Device platform architecture design

EDUCATION **University of Southern California**, Los Angeles, California, USA

Ph.D. in Computer Science

May. 2007 - Aug. 2012

Dissertation Title: Linking Eyes to Mouth – A Schema-based Computational Model for Describing Visual Scenes

Advisor: Prof. Michael A. Arbib

M.S. in Computer Science

Aug. 2005 - May. 2007

GPA: 3.93/4.0

Coursework: Algorithms, Artificial Intelligence, Artificial Neural Network, Compiler Design, Database, Operating Systems, TCP/IP Communication, 3D Graphics, Web Technologies, Natural Language Processing, Robotics, Brain Theory

Hanyang University, Seoul, Republic of Korea

B.S. in Electronics and Computer Engineering

Mar. 1996 - Feb. 2005

GPA: 3.89/4.5 (Major 4.28/4.5), Cum Laude

University of Toronto, Toronto, Canada

Academic Preparation Course (Advanced Level), International ESL Program

Sep. 2002 - Dec. 2002

Grade: A

RESEARCH EXPERIENCE **University of Southern California**, Los Angeles, California, USA

Research Assistant, USC Brain Project

May. 2009 - Dec. 2011

Principal Investigator: Prof. Michael A. Arbib

Research Topic: A computational model addressing mechanisms in producing a description of a perceived visual scene (later developed into the Ph.D. dissertation)

- Developing an **AI system for language production** (*Template Construction Grammar*) based on a distributed computing paradigm (*Schema Theory*) with applied graph-searching algorithms
- Conducting a series of **human eye-tracking experiments** and developing a specialized data analysis tool (*EyeParser*)
- Developing a number of computational models based on **artificial neural networks and machine learning** techniques – Reinforcement Learning, Back-propagation Through Time (BPTT), Leaky-integrator Model, etc.

WORK EXPERIENCE	<u>Heavy Iron Studios, Inc.</u> , Los Angeles, California, USA Core Game Engine R&D (Multi-platform Console) <i>Jul. 2013 - Present</i> Responsibilities: Enhancement of the overall quality/performance of the in-house game engine	
	Disney Infinity (Wii Platform) <i>Mar. 2013 - Jul. 2013</i> Responsibilities: Converting/enhancing multi-threaded storage system, save game system, and main application framework (disc operations, reset/shutdown, system error handling, etc.) for Wii platform	
	<u>SONNORI Co., Ltd.</u> , Seoul, Republic of Korea Trickster (currently serviced by Ntreev Soft Co., Ltd.) <i>May. 2001 - Feb. 2002</i> Genre: Massively Multiplayer Online Role Playing Game (MMORPG) Position: Lead programmer Responsibilities: Game client, Developer tools, Game engines	
	Astonishia Story R <i>Aug. 2001 - Jan. 2002</i> Genre: Role-Playing Game (RPG) for GP32 (portable video game machine) & PC Position: Associate programmer Responsibilities: Developer tools, Game engines	
	Steel Empire Mobile <i>Mar. 2001 - May. 2001</i> Genre: Mobile game for cellular phones Position: Director Responsibilities: Team management, Planning, Scenario	
	Legend of Heroes (released by Limenko Co., Ltd.) <i>Sep. 1999 - Nov. 2000</i> Genre: Street action game for arcade machines Position: Director, Lead programmer Responsibilities: Team management, Planning, Game client, Developer tools, Game engines Remark: Employed as a part-time worker due to the school schedule <i>Mar. 2000 - Nov. 2000</i>	
Steel Empire <i>Jun. 1998 - Aug. 1999</i> Genre: Real-Time Strategy (RTS) Role-Playing Game (RPG) Position: Assistant programmer Responsibilities: Developer tools, Game engines, Battle mode, World mode, Mini games		
TEACHING EXPERIENCE	<u>University of Southern California</u> , Los Angeles, California, USA Teaching Assistant , Object-Oriented Programming (CSCI 200) <i>Spring 2012</i> Teaching Assistant , Computer Graphics (CSCI 480) <i>Spring 2009</i> Teaching Assistant , Brain Theory and Artificial Intelligence (CSCI 564) <i>Fall 2008</i> Teaching Assistant , Computer Communication (CSCI 551) <i>Spring 2008</i> Teaching Assistant , Brain Theory and Artificial Intelligence (CSCI 564) <i>Fall 2007</i>	
	<u>GAMESCHOOL</u> , Seoul, Republic of Korea Invited lecturer , Algorithm and data structure for computer games <i>Aug. 2001</i>	
	PUBLICATIONS	[1] Lee, J. , & Arbib, M. A. (In Preparation). “The Temporal Unfolding of Eye Movements and Utterance Formulation.”
		[2] Lee, J. , & Arbib, M. A. (In Preparation). “Implementing Template Construction Grammar (TCG) for Visual Scene Description.”
		[3] Barrés, V., & Lee, J. (2013). “Template Construction Grammar: From Visual Scene Description to Language Comprehension and Agrammatism.” <i>Neuroinformatics</i> , Published Online.

- [4] **Lee, J.** & Barrés, V. (2012). “Template Construction Grammar: From Visual Scene Description to Language Comprehension.” *Neuroinformatics*, Submitted
- [5] **Lee, J.**, & Arbib, M. A. (2011). “The Temporal Unfolding of Eye Movements and Scene Description.” *Poster presented at The Neurobiology of Language Conference.*
- [6] Barrés, V., **Lee, J.** & Arbib, M. A. (2011). “Template Construction Grammar (TCG) as a Model of Comprehension.” *Poster presented at the Neurobiology of Language Conference.*
- [7] **Lee, J.** & Arbib, M. A. (2010). “Implementing Template Construction Grammar (TCG) for Generating Descriptions of Visual Scenes.” *Poster presented at the Neurobiology of Language Conference.*
- [8] **Lee, J.**, Yang, B. & Arbib, M. A. (2010). “Eye Movements and the Temporal Unfolding of Scene Description.” *Poster presented at the Neurobiology of Language Conference.*
- [9] **Lee, J.** & Arbib, M. A. (2010). “Implementing Template Construction Grammar (TCG).” *Paper presented at the 10-th conference of Conceptual Structure, Discourse and Language.*
- [10] Yang, B., **Lee, J.** & Arbib, M. A. (2010). “Eye Movements and the Unfolding of the SemRep Semantic Representation in Scene Description.” *Poster presented at the 10-th conference of Conceptual Structure, Discourse and Language.*
- [11] Arbib, M. A. & **Lee, J.** (2009). “Template Construction Grammar (TCG) and the Description of Visual Scenes.” *Poster presented at the Neurobiology of Language Conference.*
- [12] Arbib, M. A. & **Lee, J.** (2008). “Describing Visual Scenes: towards a neurolinguistics based on Construction Grammar.” *Brain Research*, 1225:146-162.
- [13] Arbib, M. A. & **Lee, J.** (2007). “Vision and Action in the Language-Ready Brain: From Mirror Neurons to SemRep.” In *BVAI (Brain, Vision, and Artificial Intelligence) 2007 LNCS 4729*, ed. F. Mele, G. Ramella, S. Santillo & F. Ventriglia, Berlin/Heidelberg, Springer-Verlag:104-123.

AWARDS & HONORS	<p>Research Assistantship, the National Science Foundation Grant No. 0924674, Research Grant from the Okawa Foundation <i>May. 2009 - Dec. 2011</i></p> <p>Academic Honor Scholarship, Hanyang University <i>Spring 2003</i></p> <p>Academic Honor Scholarship, Hanyang University <i>Fall 2000</i></p> <p>Academic Honor Scholarship, Hanyang University <i>Spring 2000</i></p>
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SERVICE & ACTIVITIES	<p>Staff and member of Korean Graduate Student Association (KGSA), USC <i>2005 - 2012</i></p> <p>Chair of <i>Hantulari</i> (a programming language study club), Hanyang University <i>1997 - 1998</i></p>
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TECHNICAL EXPERTISE	<p>Programming Languages C/C++ (professional proficiency; Windows API, MFC, GCC), Java, Javascript (jQuery, JSON), MatLab, Lua, Perl, Python, Visual Basic, HTML/PHP/.ASP, Pascal, Assembly, and more</p> <p>Natural Languages Korean (native), English (proficient)</p>
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REFERENCES

Michael A. Arbib, Ph.D.

Professor, Computer Science Department, University of Southern California
Relationship: Academic Advisor, Dissertation Chair
E-mail: arbib@usc.edu, Home: <http://neuroinformatics.usc.edu/>

Mark Pope

Studio Technical Director, Heavy Iron Studios, Inc.
Relationship: Colleague
E-mail: mark.pope@heavy-iron.com, Home: <http://www.heavy-iron.com/>

Youjip Won, Ph.D.

Associate Professor, Department of Electronics and Computer Engineering, Hanyang University
Relationship: Academic Advisor
E-mail: yjwon@ece.hanyang.ac.kr, Home: <http://www.dmclab.hanyang.ac.kr/>

Kwanhee Seo

Chief Technical Officer, Ntreev Soft Co., Ltd.
Relationship: Former Colleague
E-mail: kwanny@ntreev.com, Home: <http://www.ntreev.com>