Dongkyu Choi

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Education:

Ph.D. (2010)	Aeronautics and Astronautics, Stanford University, Stanford, CA, USA with minor in Computer Science Dissertation: *Coordinated Execution and Goal Management in a Reactive Cognitive Architecture* Committee: Pat Langley, Stephen M. Rock, Nils Nilsson, Sanjay Lall
M.S. (2003)	Aeronautics and Astronautics, Stanford University, Stanford, CA, USA
B.S. (2001)	Aerospace Engineering, Seoul National University, Seoul, Korea

Professional Experience:

2019 –	Senior Scientist, Collaborative Intelligence Group Manager Agency for Science, Technology, and Research (A*STAR), Singapore
2015 –	Co-founder Powered Boomerang, LLC, Overland Park, KS, USA
2018 – 2019	Researcher Center for Design Research, University of Kansas, Lawrence, KS, USA
2012 – 2019	Assistant Professor Dept. of Aerospace Engineering, University of Kansas, Lawrence, KS, USA
2016, 2017	Summer Faculty Fellow US Naval Research Laboratory, Washington, DC, USA
2009 – 2011	Visiting Research Specialist / Postdoctoral Research Associate Dept. of Psychology, University of Illinois at Chicago, Chicago, IL, USA
2003 – 2009	Research Assistant Computational Learning Laboratory, CSLI, Stanford University, CA, USA
2003 – 2009	Research Assistant Institute for the Study of Learning and Expertise, Palo Alto, CA, USA
1997 – 2000	Computer Systems Engineer / Bilingual Translator Korean Augmentation to the United States Army, Korea

Teaching Interests and Experience:

Topics of Interest:	autonomy, cognitive/agent architectures cognitive robotics, unmanned systems
Aircraft Dynamics:	Fall 2014 – 2016
Introduction to Robotics:	Spring 2014 – 2018
Rule-based Control Systems:	Fall 2013 & 2017
Computing for Engineers:	11 semesters during 2012 – 2018

Research Interests and Project Experience:

Focus of Research: autonomy, symbolic artificial intelligence, cognitive architectures
cognitive robotics, unmanned aerial systems

2020 –	K-EMERGE: Knowledge Extraction, Modelling, and Explainable Reasoning for General Expertise AME Programme, National Research Foundation [Co-lead: SG$5,997,000]
2019 –	Human-Robot Collaborative AI for Advanced Manufacturing and Engineering AME Programme, National Research Foundation [SG$21,634,800]
2017 – 2018	Architectures for Elaborate Goal Reasoning US Naval Research Laboratory [PI; US$70,000]
2012 – 2015	Autonomous Discovery of Object Properties: Robots That Create Simple Machines Office of Naval Research [Subcontract; US$225,000]
2012 – 2012	Robotics Challenge: Cognitive Robot for General Missions Defense Advanced Research Projects Agency [PI; US$371,503]
2009 – 2011	Adaptation by Learning from Error in ICARUS Office of Naval Research [US$427,187]
2008 – 2010	Learning Task Knowledge for Cognitive Robots Korea Institute of Science and Technology [PI; ~US$85,000]
2005 – 2009	Transfer Learning in Integrated Cognitive Systems Defense Advanced Research Projects Agency [US$12,242,291]
2003 – 2005	New Research Directions in Integrated Cognitive Architectures National Science Foundation [US$99,271]

Journal Publications:

Choi, D., & Langley, P. (2018). Evolution of the ICARUS cognitive architecture. *Cognitive Systems Research, 48,* 25 – 38.

Xu, W., Choi, D., & Wang, G. (2018). Direct visual-inertial odometry with semi-dense mapping. *Computers & Electrical Engineering, 67,* 761 – 775.

Kim, E., & Choi, D. (2016). A UWB positioning network enabling unmanned aircraft systems auto land. *Aerospace Science and Technology, 58,* 418 – 426.

Kim, E., & Choi, D. (2016). Planning of UWB indoor positioning network using binary integer linear programming. *International Journal of Ultra Wideband Communications and Systems, 3,* 166 – 176.

Kim, E., & Choi, D. (2015). A 3D ad hoc localization system using aerial sensor nodes. *Journal of IEEE – Sensors, 15,* 3716 – 3723.

Choi, D. (2011). Reactive goal management in a cognitive architecture. *Cognitive Systems Research, 12,* 293 – 308.

Langley, P., Choi, D., & Rogers, S. (2009). Acquisition of hierarchical reactive skills in a unified cognitive architecture. *Cognitive Systems Research, 10,* 316 – 332.

Könik, T., O'Rorke, P., Shapiro, D., Choi, D., Nejati, N., & Langley, P. (2009). Skill transfer through goal-driven representation mapping. *Cognitive Systems Research, 10,* 270 – 285.

Langley, P., & Choi, D. (2006). Learning recursive control programs from problem solving. *Journal of Machine Learning Research, 7,* 493 – 518.

Recent Conference / Symposium Papers:

Choi, D., Langley, P., & To, S. T. (2018). Creating and using tools in a hybrid cognitive architecture. In *Proceedings of the AAAI 2018 Spring Symposium on Integrating Representation, Reasoning, Learning, and Execution for Goal Directed Autonomy*. Stanford, CA: AAAI Press.

Menager, D. H., Choi, D., Roberts, M., & Aha, D. W. (2018). Learning planning operators from episodic traces. In *Proceedings of the AAAI 2018 Spring Symposium on Integrating Representation, Reasoning, Learning, and Execution for Goal Directed Autonomy*. Stanford, CA: AAAI Press.

Langley, P., Meadows, B., Sridharan, M., & Choi, D. (2017). Explainable agency for intelligent autonomous systems. In *Proceedings of the Twenty-Ninth Annual Conference on Innovative Applications of Artificial Intelligence* (pp. 4762 – 4763). San Francisco: AAAI Press.

Menager, D. H., Choi, D., Floyd, M. W., Task, C., & Aha, D. W. (2017). Dynamic goal recognition using windowed action sequences. In *Proceedings of the AAAI-2017 Workshop on Plan, Activity, and Intent Recognition*.

Xu, W., & Choi, D. (2016). Direct visual-inertial odometry and mapping for unmanned vehicle. *Lecture Notes in Computer Science: Proceedings of 12th International Symposium on Visual Computing,* Springer-Verlag.

Roberts, M., Hiatt, L. M., Coman, A., Choi, D., Johnson, B., & Aha, D. W. (2016). ActorSim: A toolkit for studying cross-disciplinary challenges in autonomous systems. In *Proceedings of the AAAI 2016 Fall Symposium on Cross-Disciplinary Challenges in Autonomous Systems*, Arlington, VA.

Menager, D. H., & Choi, D. (2016). A robust implementation of episodic memory in a cognitive architecture. In *Proceedings of the 38th Annual Meeting of the Cognitive Science Society*, Philadelphia, PA.

Langley, P., Barley, M., Meadows, B., Choi, D., & Katz, E. P. (2016). Goals, utilities, and mental simulation in continuous planning. In *Proceedings of the Fourth Annual Conference on Cognitive Systems*, Evanston, IL.

Kim, J., & Choi, D. (2016). Design and control of a novel tiltrotor platform. In *Proceedings of AIAA Infotech @ Aerospace, AIAA Science and Technology Forum and Exposition*, San Diego, CA.

To, S. T., Langley, P., & Choi, D. (2015). A unified framework for knowledge-lean and knowledge-rich planning. In *Proceedings of the Third Annual Conference on Advances in Cognitive Systems*, Atlanta, GA.

Choi, D., Kim, K., Kim, D., & You, B.-J. (2011). Problem solving and learning for a humanoid robot. In *Proceedings of the IEEE International Conference on Robotics and Biomimetics*, Phuket, Thailand: IEEE Press.

Kim, K., Choi, D., Lee, J.-Y., Park, J.-M., & You, B.-J. (2011). Controlling a humanoid robot in home environment with a cognitive architecture. In *Proceedings of the IEEE International Conference on Robotics and Biomimetics*, Phuket, Thailand: IEEE Press.

Choi, D., & Ohlsson, S. (2011). Interoperating learning mechanisms in a cognitive architecture. In *Proceedings of the AAAI 2011 Fall Symposium on Advanced in Cognitive Systems*, Arlington, VA: AAAI Press.

Choi, D., & Ohlsson, S. (2011). Effects of multiple learning mechanisms in a cognitive architecture. In *Proceedings of the 33rd Annual Meeting of the Cognitive Science Society* (pp. 3003 – 3008). Boston, MA: Cognitive Science Society, Inc.

Kim, K., Lee, J.-Y., Choi, D., Park, J.-M., & You, B.-J. (2010). Autonomous task execution of a humanoid robot using a cognitive model. In *Proceedings of the IEEE International Conference on Robotics and Biomimetics*, Tianjin, China: IEEE Press.

Choi, D., & Ohlsson, S. (2010). Learning from failures for cognitive flexibility. In *Proceedings of the 32nd Annual Meeting of the Cognitive Science Society*, Portland, OR: Cognitive Science Society, Inc.

Choi, D. (2010). Nomination and prioritization of goals in a cognitive architecture. In *Proceedings of the 10th International Conference on Cognitive Modeling*, Philadelphia, PA: Drexel University.

Choi, D. (2010). Reactive goal management in a cognitive architecture. In *Proceedings of the AAAI-2010 Workshop on Goal-Directed Autonomy*, Atlanta, GA: AAAI Press.

Choi, D., & Ohlsson, S. (2010). Cognitive flexibility through learning from constraint violations. In *Proceedings of the Nineteenth Annual Conference on Behavior Representation in Modeling Simulation*, Charleston, SC.

Choi, D., Kang, Y., Lim, H., & You, B.-J. (2009). Knowledge-based control of a humanoid robot. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems*, St. Louis, MO: IEEE Press.

Choi, D. (2009). Concurrent execution in a cognitive architecture. In *Proceedings of the 31st Annual Meeting of the Cognitive Science Society*, Amsterdam, Netherlands: Cognitive Science Society, Inc.

Ali, K., Leung, K., Könik, T., Choi, D., & Shapiro, D. (2009). Knowledge-directed theory revision. In *Proceedings of the Seventeenth International Conference on Inductive Logic Programming*, Leuven, Belgium: Springer-Verlag.

* For papers published before 2009, see my Google Scholar page.

Professional Service:

Program Co-chair: ACS 2018
Organizing Committee Member: CogSci 2010 – 2014
Senior Program Committee Member: AAAI 2018
Program Committee Member: AAAI 2012 & 2017; ACS 2013
Journal Reviewer: Artificial Intelligence (2013); Machines (2013); Computational Intelligence (2011); Cognitive Systems Research (2011); AGI (2011)
Conference Reviewer: IROS 2013, ICAR 2013, Humanoids 2012, CogSci 2012, ICRA 2011, CogSci 2011, BRiMS 2010, and others
Session Chair: IROS 2009

Certifications and Languages:

Microsoft Certified Professional (MCP) (1997 –)
Microsoft Certified Systems Engineer (MCSE) (1997 – 2001)
Korean (native), English (fluent), Japanese (limited)