

# Naoya Inoue, Ph. D.

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## Research Interests

- Natural Language Processing (Discourse Processing)
- Commonsense Reasoning
- Logical Inference

## Degrees

- 2013 Ph. D. Information Science. Tohoku University, Sendai, Japan.  
2010 M. S. Engineering. Nara Institute of Science and Technology, Nara, Japan.  
2008 B. A. Economics. Musashi University, Tokyo, Japan.

## Education

- Apr. 2010 – Mar. 2013 PhD student at Graduate School of Information Sciences at Tohoku University, Japan Society for the Promotion of Science (JSPS) Fellow (DC1)
- Apr. 2008 – Mar. 2010 Student at Graduate School of Information Science, Nara Institute of Science and Technology
- Apr. 2006 – Mar. 2007 Exchange student at Korea University
- Apr. 2004 – Mar. 2008 Student at Faculty of Economics at Musashi University

## Professional Experience

- Apr. 2017 – Sep. 2017 Visiting researcher at University College London, UK (host: Sebastian Riedel)
- Sep. 2016 – Feb. 2017 Visiting researcher at University of Southern California / Institute for Creative Technologies, USA (host: Andrew S. Gordon)

Aug. 2015 – Current	Assistant professor at Tohoku University
Jul. 2013 – Jul. 2015	Researcher at DENSO CORPORATION
Apr. 2013 – Jul. 2015	Postdoctoral researcher at Tohoku University
June. 2012 – Aug. 2012	Research intern at Information Sciences Institute at University of Southern California, USA. (host: Jerry Hobbs) <i>Task:</i> Abduction-based coreference resolution
Sep. 2011 – Dec. 2011	Visiting researcher at Information Sciences Institute at University of Southern California, USA. (host: Jerry Hobbs) <i>Task:</i> Development of Integer Linear Programming-based framework for abductive inference
Sep. 2009 – Dec. 2009	Research intern at NHN Corporation, South Korea. <i>Task:</i> Extraction of synonymous word pairs and transliteration pairs

## **Grants**

Oct. 2016 — Mar. 2018	Japan Society for the Promotion of Science (JSPS) Grants-in-Aid for Scientific Research, “Structuring and Aggregating Widely Spread Pieces of World Knowledge.” (Principal Investigator, 2,990,000JPY, 16H06614)
Apr. 2015 — Mar. 2019	Japan Society for the Promotion of Science (JSPS) Grants-in-Aid for Scientific Research, “Reading between the Lines by Integrating Logical Inference, Machine Learning and Physics Simulation” (Collaborator, 21,060,000JPY, 15H01702)
Apr. 2010 — Mar. 2013	Japan Society for the Promotion of Science (JSPS) Research Fellowship, “Development of Interaction Simulator and Its Application to Discourse Analysis.” (Principal Investigator, 1,200,000JPY, 10J09719)
May. 2008 – Mar. 2009	Creative and International Competitiveness Project Leader (CICP2008), “Dear Proofreaders: Development of Proofread Network with Blog Plugin”, Nara Institute of Science and Technology.

## **Awards**

2016	Annual Meeting Excellent Paper, Association for Natural Language Processing (in Japan)
2014	Annual Meeting Excellent Paper, Association for Natural Language Processing (in Japan)
2013	Dean's Award for Excellence in Graduate School of Information Sciences at Tohoku University
2012	Honorable Mention, the 15 <sup>th</sup> Information-Based Induction Sciences Workshop
2012	IPSJ Yamashita SIG Research Award
2012	Annual Meeting Excellent Paper, Association for Natural Language Processing (in Japan)
2010	Information Processing Society Japan (IPSJ) Certificate of Excellent Master's Thesis.

## **Reviewer**

- Association for the Advancement of Artificial Intelligence (AAAI): 2014
- Empirical Methods in Natural Language Processing (EMNLP): 2015, 2017
- Association for Computational Linguistics (ACL): 2016, 2017
- Computational Linguistics (COLING): 2016
- Transactions on Asian and Low-Resource Language Information Processing (TALIP): 2016
- Scientific Document Analysis Workshop (SCIDOCA): 2016, 2017
- International Conference on Artificial Intelligence (ICOAI): 2016
- Journal of Natural Language Processing (JNLP): 2013, 2015
- Journal of Japanese Society for Artificial Intelligence (JSAI): 2013, 2015, 2017
- International Symposium on Commonsense Reasoning: 2017
- International Conference on Language Resources and Evaluation (LREC): 2018

## **Selected Publications**

### **International conferences**

Naoya Inoue, Yuichiro Matsubayashi, Masayuki Ono, Naoaki Okazaki and Kentaro Inui. Modeling Context-sensitive Selectional Preference with Distributed

Representations. In *Proceedings of the 26th International Conference on Computational Linguistics*, December 2016.

Naoya Inoue, Yasutaka Kuriya, Sosuke Kobayashi and Kentaro Inui. Recognizing potential traffic risks through logic-based deep scene understanding. In *Proceedings of the 22nd ITS World Congress*, October 2015.

Paul Reisert, Naoya Inoue, Naoaki Okazaki and Kentaro Inui. A Computational Approach for Generating Toulmin Model Argumentation. In *Proceedings of the 2nd Workshop on Argumentation Mining*, pp.45–55, June 2015.

Canasai Kruengkrai, Naoya Inoue, Jun Sugiura, and Kentaro Inui. An Example-Based Approach to Difficult Pronoun Resolution. In *Proceedings of the 28th Pacific Asia Conference on Language, Information and Computing*, pp.358-367, December 2014.

Jun Sugiura, Naoya Inoue and Kentaro Inui. Recognizing Implicit Discourse Relations through Abductive Reasoning with Large-scale Lexical Knowledge. In *Proceedings of the 1st Workshop on Natural Language Processing and Automated Reasoning*, September 2013.

Kazeto Yamamoto, Naoya Inoue, Yotaro Watanabe, Naoaki Okazaki and Kentaro Inui. Discriminative Learning of First-order Weighted Abduction from Partial Discourse Explanations. In *Proceedings of the 14th International Conference on Intelligent Text Processing and Computational Linguistics*, pp.545-558, March 2013.

Naoya Inoue, Ekaterina Ovchinnikova, Kentaro Inui, and Jerry R. Hobbs. Coreference Resolution with ILP-based Weighted Abduction. In *Proceedings of the 24th International Conference on Computational Linguistics*, pp.1291-1308, December 2012.

Naoya Inoue and Kentaro Inui. Large-scale Cost-based Abduction in Full-fledged First-order Predicate Logic with Cutting Plane Inference. In *Proceedings of the 13th European Conference on Logics in Artificial Intelligence*, pp.281-293, September 2012.

Naoya Inoue and Kentaro Inui. ILP-based Reasoning for Weighted Abduction. In *Proceedings of AAAI Workshop on Plan, Activity and Intent Recognition*, pp. 25-32, August 2011.

### **Journal papers**

Ryo Takahashi, Naoya Inoue, Yasutaka Kuriya, Sosuke Kobayashi, and Kentaro Inui. Explaining potential risks in traffic scenes by combining logical inference and physics simulation. *International Journal of Machine Learning and Computing*, Vol. 6, No. 5, pp. 248-255, October 2016.

Kazeto Yamamoto, Naoya Inoue, Kentaro Inui, Yuki Arase and Jun'ichi Tsujii. Boosting the Efficiency of First-order Abductive Reasoning Using Pre-estimated Relatedness between Predicates. *International Journal of Machine Learning and Computing*, Vol. 5, No. 2, pp. 114-120, April 2015.

Naoya Inoue and Kentaro Inui. ILP-based Inference for Cost-based Abduction on First-order Predicate Logic. *Journal of Natural Language Processing*, Vol.20, No.5, pp.629-656, December 2013.

Naoya Inoue, Ryu Iida, Kentaro Inui, and Yuji Matsumoto. Resolving Direct and Indirect Anaphora for Japanese Definite Noun Phrases (in Japanese). *Journal of Natural Language Processing*, Vol.17, No.1, pp.221-246, January 2010.

### **Book chapter**

Naoya Inoue, Ekaterina Ovchinnikova, Kentaro Inui, and Jerry R. Hobbs. Weighted Abduction for Discourse Processing Based on Integer Linear Programming. In Gita Sukthankar, Christopher Geib, Robert P. Goldman, Hung Bui, and David V. Pynadath (Eds), *Plan, Activity, and Intent Recognition*, Elsevier, pp.33-55, March 2014.

### **Thesis**

Naoya Inoue. Exploiting World Knowledge in Discourse Processing: A Comparison of Feature-Based and Inference-Based Approaches. *Doctoral Dissertation, Tohoku University*. (Advisor: Kentaro Inui)

Naoya Inoue. Anaphora Resolution for Japanese Definite Noun Phrases. Master's thesis, Graduate School of Information Science. *Nara Institute of Science and Technology*. (Advisor: Kentaro Inui and Yuji Matsumoto)

### **Language Skills**

Japanese (Native), English (Business and conversational), Korean (Conversational)

### **Computer skills**

*Languages:* Python, C++, C, JavaScript, HTML, BASIC, Object Pascal

*Platforms:* Mac OS X, Linux, Windows