

Hayate Iso

PHD IN ENGINEERING · NLP/LLM RESEARCHER

Mountain View, California, USA

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Summary

Senior Research Scientist with a strong focus on developing and evaluating AI agents and Large Language Models (LLMs). Expertise in long-context understanding, task-oriented natural language processing, and AI agent development. Proven track record in designing and optimizing LLMs through high-impact publications and collaborations within cross-functional teams.

Work Experience

Megagon Labs

Mountain View, CA

SENIOR RESEARCH SCIENTIST

Jan. 2021 - Present

- Designed and developed internal compound AI systems, focusing on AI agents leveraging LLMs for multi-step/multi-modal reasoning, evaluation, and decision-making.
- Evaluated long-context reasoning capabilities of LLMs, measuring their ability to handle complex information across large documents
- Implemented instruction optimization and parameter-efficient fine-tuning techniques (LoRA, P-tuning) to improve LLM performance in human-agent interaction
- Developed comprehensive LLM evaluation strategies, including performance benchmarking, bias analysis, and faithfulness in generated outputs
- Mentored research interns and junior team members, leading to the successful publication of high-impact papers on LLM evaluations, retrieval-augmented generation (RAG), and instruction ambiguity.
- Selected Artifacts:** [\[EMNLP 2024\]](#) [\[NAACL 2024\]](#) [\[LREC-COLING 2024\]](#) [\[EACL 2024\]](#) [\[IJCNLP-AACL 2023\]](#) [\[ACL 2022 Findings\]](#) [\[R&D Award \(Internal\)\]](#) [\[Best Presenter at Cross/Engine Forum \(Internal\)\]](#)

Amazon

Seattle, WA (remote)

APPLIED SCIENTIST INTERN

Jul. 2020 - Oct. 2020

- Developed a text-editing model to enhance Alexa's conversational AI by correcting Speech-to-Text errors using retrieval-augmented generation systems.
- Collaborated with engineering teams to optimize model evaluation and fine-tune tools for large-scale deployment

Megagon Labs

Mountain View, CA

RESEARCH INTERN

Feb. 2020 - Jul. 2020

- Developed an unsupervised opinion summarization method using VAE and a convex aggregation approach, achieving state-of-the-art performance.
- Artifacts:** [\[EMNLP 2021 Findings\]](#) [\[Code\]](#) [\[R&D Award \(Internal\)\]](#)

ByteDance

Beijing, China

RESEARCH INTERN

May. 2019 - Nov. 2019

- Worked on an automated system for updating outdated text using a knowledge base, enhancing content accuracy and relevance.
- Proposed a new text editing task, fact-based text editing, in which the goal is to revise a given document to better describe the facts in a knowledge base.
- Artifacts:** [\[ACL 2020\]](#) [\[Code\]](#) [\[US Patent\]](#)

Advanced Industrial Science and Technology

Tokyo, Japan

TECHNICAL TRAINEE

Oct. 2018 - Dec. 2018

- Developed a data-to-text model that tracks entity state while generating long texts from large structured data.
- Artifacts:** [\[ACL 2019\]](#) [\[Code\]](#) [\[Data\]](#)

Japan Society for the Promotion of Science

Tokyo, Japan

RESEARCH FELLOWSHIPS FOR YOUNG SCIENTISTS (DC1)

Apr. 2018 - Feb. 2020

- Awarded the most prestigious governmental research fellowship in Japan.
- Received a monthly stipend of 200,000 JPY and an annual research grant of approximately 800,000 JPY for up to three years. Resigned in February 2020 to participate in a research internship.

RaRe Technologies

Remote

STUDENT INCUBATOR

Jul. 2016 - Sep. 2016

- Enhanced the GenSim library by implementing online vocabulary updating functionality for Word2Vec, supporting continual learning.
- Developed comprehensive tutorial notebooks to guide users on the effective application of Doc2Vec for continual learning scenarios.

Publication

1. Holistic Reasoning with Long-Context LMs: A Benchmark for Database Operations on Massive Textual Data

Seiji Maekawa*, Hayate Iso*, Nikita Bhutani (*equal first author)
under submission to *ICLR*

2. **From Single to Multi: How LLMs Hallucinate in Multi-Document Summarization**

Catarina G Belém, Pouya Pezeshkpour, Hayate Iso, Seiji Maekawa, Nikita Bhutani, Estevam Hruschka
under submission to *NAACL*

3. **Evaluating Bias in LLMs for Job-Resume Matching: Gender, Race, and Education**

Hayate Iso, Pouya Pezeshkpour, Nikita Bhutani, Estevam Hruschka
under submission to *COLING*

4. **AmbigNLG: Addressing Task Ambiguity in Instruction for NLG**

Ayana Niwa, Hayate Iso

In *Empirical Methods in Natural Language Processing (EMNLP)*, 2024 [\[Outstanding Young Researcher's Paper \(18/427 \$\approx\$ 4.2%\) in ANLP\]](#)

5. **A Blueprint Architecture of Compound AI Systems for Enterprise**

Eser Kandogan, Sajjadur Rahman, Nikita Bhutani, Dan Zhang, Rafael Li Chen, Kushan Mitra, Sairam Gurajada, Pouya Pezeshkpour, Hayate Iso, Yanlin Feng, Hannah Kim, Chen Shen, Jin Wang, Estevam Hruschka
In *Compound AI Systems workshop*, 2024

6. **Retrieval Helps or Hurts? A Deeper Dive into the Efficacy of Retrieval Augmentation to Language Models**

Seiji Maekawa, Hayate Iso, Sairam Gurajada, Nikita Bhutani

In *North American Chapter of the Association for Computational Linguistics (NAACL)*, 2024 [\[Oral, Featured in Engine Forum'24\]](#)

7. **Distilling Large Language Models using Skill-Occupation Graph Context for HR-Related Tasks**

Pouya Pezeshkpour, Hayate Iso, Thom Lake, Nikita Bhutani, Estevam Hruschka
pre-print arXiv:2311.06383, 2023

8. **XATU: A Fine-grained Instruction-based Benchmark for Explainable Text Updates**

Haopeng Zhang, Hayate Iso, Sairam Gurajada, Nikita Bhutani

In *Joint International Conference On Computational Linguistics, Language Resources And Evaluation (LREC-COLING)*, 2024

9. **Less is More for Long Document Summary Evaluation by LLMs**

Yunshu Wu*, Hayate Iso*, Pouya Pezeshkpour, Nikita Bhutani, Estevam Hruschka (*equal first author)

In *European Chapter of the Association for Computational Linguistics (EACL)*, 2024 [\[Oral & Poster, Featured in Engine Forum'24\]](#)

10. **Zero-shot Triplet Extraction by Template Infilling**

Bosung Kim, Hayate Iso, Nikita Bhutani, Estevam Hruschka, Ndapa Nakashole, Tom M. Mitchell

In *Asia-Pacific Chapter of the Association for Computational Linguistics and International Joint Conference on Natural Language Processing (ACL-IJCNLP)*, 2023 [\[Oral, Featured in Engine Forum'23\]](#)

11. **Noisy Pairing and Partial Supervision for Opinion Summarization**

Hayate Iso, Xiaolan Wang, Yoshihiko Suhara

In *International Natural Language Generation Conference (INLG)*, 2024

12. **AutoTemplate: A Simple Recipe for Lexically Constrained Text Generation**

Hayate Iso

In *International Natural Language Generation Conference (INLG)*, 2024

13. **Comparative Opinion Summarization via Collaborative Decoding**

Hayate Iso, Xiaolan Wang, Stefanos Angelidis, Yoshihiko Suhara

In *Findings of the Association for Computational Linguistics (ACL)*, 2022 [\[R&D Award'22, Featured in Cross/Engine Forum'23\]](#)

14. **Convex Aggregation for Opinion Summarization**

Hayate Iso, Xiaolan Wang, Yoshihiko Suhara, Stefanos Angelidis, Wang-Chiew Tan

In *Findings of the Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2021 [\[R&D Award'21\]](#)

15. **End-to-end Biomedical Entity Linking with Span-based Dictionary Matching**

Shogo Ujiie, Hayate Iso, Shuntaro Yada, Shoko Wakamiya, Eiji Aramaki

In *Biomedical Natural Language Processing Workshop (BioNLP)*, 2021

16. **Biomedical Entity Linking with Contrastive Context Matching**

Shogo Ujiie, Hayate Iso, Eiji Aramaki

preprint arXiv:2106.07583, 2021

17. **Fact-based Text Editinng**

Hayate Iso, Chao Qiao, Hang Li

In *Proceedings of Association for Computational Linguistics (ACL)*, 2020 [US Patent 11,669,679]

18. **Learning to Select, Track, and Generate for Data-to-Text**

Hayate Iso, Yui Uehara, Tatsuya Ishigaki, Hiroshi Noji, Eiji Aramaki, Ichiro Kobayashi, Yusuke Miyao, Naoaki Okazaki, Hiroya Takamura
In *Proceedings of Association for Computational Linguistics (ACL)*, 2019.

19. **Wisdom in Adversity: A Twitter Study of the Japanese Tsunami**

Paolo Casani, Hayate Iso, Shoko Wakamiya, Eiji Aramaki
Advances in Social Networks Analysis and Mining (ASONAM), 2018

20. **NTCIR13 MedWeb Task: Multi-label Classification of Tweets using an Ensemble of Neural Networks**

Hayate Iso, Camille Ruiz, Taichi Murayama, Katsuya Taguchi, Ryo Takeuchi, Hideya Yamamoto, Shoko Wakamiya, Eiji Aramaki
In *Proceedings of NTCIR Conference on Evaluation of Information Access Technologies*, 2017 [1st place in all tracks, Best System Award]

21. **Density Estimation for Geolocation via Convolutional Mixture Density Network.**

Hayate Iso, Shoko Wakamiya, Eiji Aramaki
arXiv preprint arXiv:1705.02750, 2017.

22. **Conditional Density Estimation of Tweet Location: A Feature-Dependent Approach**

Hayate Iso, Shoko Wakamiya, Eiji Aramaki
Medinfo, 2017

23. **Forecasting Word Model: Twitter-based Influenza Surveillance and Prediction**

Hayate Iso, Shoko Wakamiya, Eiji Aramaki
In *Proceedings of International Conference on Computational Linguistics (COLING)*, 2016 [Oral, Outstanding Research in IPSJ-SIGNL]

Invited Talks

Artificial Intelligence Research Center at Advanced Industrial Science and Technology

LLM EVALUATIONS: LONG-CONTEXT LANGUAGE MODELS AND RETRIEVAL AUGMENTED GENERATIONS

Tokyo, Japan

Sept. 2024

Engine Forum

LEVERAGING GENAI TO NUDGE THE LAST MILE DECISION-MAKING WITH COMPARATIVE OPINION SUMMARIZATION

Tokyo, Japan

June. 2023

Cross Forum

LEVERAGING GENAI TO NUDGE THE LAST MILE DECISION-MAKING WITH COMPARATIVE OPINION SUMMARIZATION

Tokyo, Japan

May. 2023

Young Researcher Association for NLP Studies

OPINION SUMMARIZATION FROM CUSTOMER REVIEWS

Remote

Aug. 2022

Honors & Awards

- 2023 **Best Presenter**, Cross/Engine Forum
- 2022 **R&D Award**, Recruit Holdings
- 2021 **R&D Award**, Recruit Holdings
- 2018 **Exemption the full amount of scholarship repayment**, JASSO
- 2017 **Best System Award (1st place)**, NTCIR13-MedWeb
- 2016 **Outstanding Research Award**, IPSJ-SIGNL
- 2016 **Extracurricular Research Funds (\$10,000)**, Osaka University

Education

Nara Institute of Science and Technology

PH.D. IN INFORMATION SCIENCE

Nara, Japan

Oct. 2017 - Mar. 2021

Nara Institute of Science and Technology

M.E. IN INFORMATION SCIENCE

Nara, Japan

Apr. 2016 - Sep. 2017

Osaka University

B.S. IN MATHEMATICAL SCIENCE

Osaka, Japan

Apr. 2014 - Mar. 2016

National Institute of Technology

A.E. IN ELECTRICAL AND ELECTRONIC ENGINEERING

Ibaraki, Japan

Apr. 2009 - Mar. 2014

Program Committees

2024 **Program Committee**, ACL Rolling Review
2023 **Program Committee**, ACL Rolling Review
2023 **Program Committee**, EMNLP Industry Track
2023 **Program Committee**, EMNLP
2023 **Program Committee**, CoNLL
2023 **Program Committee**, EACL
2023 **Program Committee**, AACL-IJCNLP
2022 **Program Committee**, ACL Rolling Review
2022 **Program Committee**, EMNLP
2022 **Program Committee**, AACL-IJCNLP
2021 **Program Committee**, ACL Rolling Review
2021 **Program Committee**, ACL-IJCNLP.
2020 **Program Committee**, AACL-IJCNLP.
2020 **Program Committee**, Young Researcher Association for NLP Studies (YANS).
2019 **Program Committee**, Young Researcher Association for NLP Studies (YANS).
2018 **Program Committee**, COLING.