

Cong Duy Vu Hoang, PhD

Applied Science Leader | NLP | Generative AI | Agentic AI | Analytics AI | Healthcare AI

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Professional Summary

Senior Applied Science Leader and researcher with **15+ years** of experience across NLP, Deep Learning, Generative AI, LLMs, and Agentic AI. Currently managing cross-functional AI research programs at Oracle, driving production-grade NL2SQL, NL2Code, and AI assistant systems across Oracle's enterprise cloud portfolio (OAC, OCI, ODA, OHAI). Recognized inventor, researcher, and team builder with a consistent track record of translating cutting-edge research into high-impact products.

- **Research:** 1,350+ citations, h-index 13, i10-index 17; publications at ACL, EMNLP, NAACL, COLING (2010–2026)
- **Invention:** 34 granted U.S. patents & more than 42 pending spanning NL2SQL, NL2Code, LLM training, NER, and dialog systems
- **Leadership:** Manages multiple science teams; sets technical direction; bridges research and product across global engineering orgs

Technical Skills

Research Areas	NLP/NLU, Generative AI, LLMs, NL2SQL, NL2Code, Agentic AI, Conversational AI, Neural MT, Dialog Systems
Programming	Python, C++, Java
ML / DL	Transformers, Fine-Tuning (SFT/RLHF), RAG, Knowledge Distillation, Seq2Seq, Attention Mechanisms, Intent Classification, NER
Domains	Enterprise Analytics, Database AI, Code Generation, Conversational AI, Natural Language Interfaces, Synthetic Data Generation, Long-Context LLMs, Multilingual NLP, Continual Learning, On-Device AI

Professional Experience

Oracle Corporation	Melbourne, Australia
Senior Manager, Applied Science & AI	Oct 2024 – Present
Senior Principal Applied Scientist	Sep 2022 – Oct 2024
Principal Applied Scientist	May 2019 – Sep 2022

- **Agentic AI Platforms:** At Oracle Analytics Cloud (OAC) — built Agentic Data Agents, Notebook Code Assist Agent, and Deep Analytics Research Agent, enabling autonomous multi-step data exploration and insight generation; at Oracle Health & AI (OHAI) — developed Health Analytics Agent and Referral Agent, applying LLM-based reasoning to clinical and operational workflows.
- **NL2SQL at Enterprise Scale:** Technical lead for generative AI services on Oracle Cloud Infrastructure (OCI); designed and shipped the [C20MRL / SQL Dialogs](#) framework — translating natural language into Oracle SQL, PL/SQL, and NL2Viz — now deployed to enterprise customers globally.
- **AI Developer Tooling:** Led the science behind [Oracle Code Assist](#) (NL2Code for Java, SuiteScript/NetSuite), the [Analytics AI Assistant \(NL2Viz\)](#), and proactive PR Review Agents for the Oracle Semantic Object Model developer workflow, improving developer productivity for thousands of Oracle cloud users.
- **NLP Infrastructure:** Built and deployed production deep-learning models for intent classification and named entity recognition powering [Oracle Digital Assistant \(ODA\)](#) and Oracle AI Services at enterprise scale.
- **Research & IP Output:** Co-authored 5+ papers published at NAACL 2025, ACL 2025, and ACL 2026; led IP pipeline producing 34 granted U.S. patents and more than 42 pending applications.
- **Performance:** Consistently rated *Outstanding* (2019–2021) and *Exceeding Expectations* (2021–2025).

Speak.AI (spin-off of Voicebox Technologies; acquired by Oracle)	US (remote from Australia)
AI Scientist	Sep 2018 – May 2019

- Designed a Seq2Seq semantic parser for high-precision natural language understanding in enterprise conversational AI applications.
- Engineered a complete on-device, task-oriented dialogue system in C++ for edge deployment (Raspberry Pi, MStar SoC) — achieving low-latency, offline-capable AI interactions.

NAVER LABS Europe (formerly Xerox Research Centre Europe)	Grenoble, France
Research Intern — NLP	Mar 2018 – Jun 2018

- Developed a Moment Matching training framework with Dr. Marc Dymetman for integrating prior/external knowledge into Neural MT; resulted in a US patent (2021) and arXiv publication.

Carnegie Mellon University, Language Technologies Institute

Pittsburgh, PA, USA

Visiting Scholar

Jun 2017 – Aug 2017

- Researched low/zero-resource Neural Machine Translation at JSALT 2017 (Jelinek Memorial Workshop on Speech and Language Technology).

Institute for Infocomm Research (I²R), A*STAR

Singapore

Senior Research Engineer

Mar 2011 – Jun 2015

- **NIST OpenMT 2015:** Led development of I²R's hybrid SMT system, achieving **3rd place globally** (out of 20 teams) across all informal genre tracks (SMS, Chat, Conversational Speech).
- Built a Vietnamese-English MT system that matched Google Translate and significantly outperformed Bing Translate by BLEU/NIST/METEOR, deployed for government use (CSIT Singapore).
- Delivered multilingual MT research across Vietnamese, Chinese, and Malay — covering rule-augmented SMT, factored models, and custom tokenization.
- **Performance:** Consistently high annual ratings throughout tenure; top-rated in 2012–2013.

VNU University of Science (HCMUS)

Ho Chi Minh City, Vietnam

Teaching & Research Assistant

Oct 2006 – Aug 2008

- Taught C/C++ Programming, Data Structures & Algorithms, and NLP at undergraduate level.
- Led government-funded English-Vietnamese MT research; developed EVTranslator (English-Vietnamese SMT system); project rated *Excellent* (9/10).

Education

The University of Melbourne (UniMelb)

VIC, Australia

Doctor of Philosophy (PhD), Engineering — NLP & Deep Learning

Jun 2015 – Jun 2019

- Thesis: *On the Use of Prior and External Knowledge in Neural Sequence Models*
- Supervisors: Prof. Trevor Cohn (UniMelb) & Prof. Gholamreza Haffari (Monash University)

National University of Singapore (NUS)

Singapore

Master of Science (MSc), Computer Science

Aug 2008 – Dec 2010

- Thesis: *Towards Automated Related Work Summarization*; Advisor: Assoc. Prof. Min-Yen Kan

VNU University of Science (HCMUS)

Ho Chi Minh City, Vietnam

Bachelor of Science (BSc, First Class Honors), Computer Science

Oct 2002 – Aug 2006

- GPA: 8.35/10 (Excellent) Best Thesis: *Topic-based Retrieval of Vietnamese On-line News Articles* (10/10)

Patents

Portfolio: 34 granted U.S. patents & more than 42 pending — spanning NL2SQL, NL2Code, LLM training, NER, and dialog systems. Selected representative patents; underline marks CDV Hoang.

- **Large language models for NL2SQL with long context finetuning.** US Patent App. 19/035,561 (2026, pending). *CDV Hoang et al.*
- **Detecting out-of-domain, out-of-scope, and confusion-span (OOCs) input for NL2Logical Form models.** US Patent 12,608,373 (2026). *G. Tangari, CDV Hoang, P. Zaremoondi, P. Arthur, N. Mathur, ME. Johnson, TL. Duong.*
- **Lexical dropout for natural language processing.** US Patent 12,572,852 (2026). *TQ. Pham, CDV Hoang, T.T. Vu, ME. Johnson, TL. Duong.*
- **Gazetteer integration for neural named entity recognition.** US Patent 12,566,921 (2026). *TQ. Pham, CDV Hoang, ME. Johnson, TL. Duong.*
- **Techniques for using named entity recognition to resolve entity expression.** US Patent 12,554,929 (2026). *A.D. Kanuga, CDV Hoang, ME. Johnson, V. Raghavendra, Y. Wu, S.W.C. Siu, et al.*
- **Addressing catastrophic forgetting and over-generalization in neural networks.** US Patent 12,541,672 (2026). *CDV Hoang et al.*
- **Techniques for efficient encoding in neural semantic parsing systems.** US Appl. 18/409,676 (2025). *CDV Hoang, P. Zaremoondi, T.T. Vu, G. Tangari, ME. Johnson, TL. Duong, V. Vishnoi.*
- **Framework for focused training of language models and end-to-end hypertuning.** US Appl. 19/085,675 (2025). *P. Zaremoondi, CDV Hoang, D. Vu, D.H. Tran, B. Saha, et al.*

- **Techniques for converting a natural language utterance to an intermediate database query representation.** US Appl. 18/209,844 (2024). *CDV Hoang, S.A. McRitchie, ME. Johnson, et al.*
- **Context tag integration with named entity recognition models.** US Appl. 17/648,376 (2022). *D. Vu, TQ. Pham, CDV Hoang, S.P.K. Gadde, TL. Duong, ME. Johnson, V. Vishnoi.*
- **Method and system for over-prediction in neural networks.** US Appl. 17/455,181 (2022). *CDV Hoang, T.T. Vu, P. Zaremoondi, Y. Xu, et al.*
- **Method and system for training neural sequence-to-sequence models by incorporating global features.** US Pub. 2021/0110254 (2021). *CDV Hoang, I. Calapodescu, M. Dymetman.*
- **Task-oriented dialog suitable for a standalone device.** US Appl. 17/005,847 (2021). *TL. Duong, ME. Johnson, CDV Hoang, TQ. Pham, Y.-H. Hong, et al.*

Selected Publications

Google Scholar: 1,350+ citations / h-index 13 / i10-index 17. Underline = CDV Hoang.

- [2026] *T. Sarwar, F. Moghimifar, CDV Hoang, X. Ma, S.C. Xu, F. Saleh, P. Zaremoondi, A. Sil, K. Kirchhoff.* CLARITY: A Framework and Benchmark for Conversational Language Ambiguity and Unanswerability in Interactive NL2SQL Systems. **ACL 2026 (Industry Track)**.
- [2025] *CDV Hoang, G. Tangari, C. Lanfranchi, D. Guo, et al.* Distill-C: Enhanced NL2SQL via Distilled Customization with LLMs. **NAACL 2025 (Industry Track)**.
- [2025] *M. Chen, P. Arthur, CDV Hoang, et al.* Mastering the Craft of Data Synthesis for CodeLLMs. **NAACL 2025 (Long Paper)**.
- [2025] *Q.D. Nguyen, CDV Hoang, D.Q. Vu, G. Tangari, et al.* SQLong: Enhanced NL2SQL for Longer Contexts with LLMs. **ACL 2025 (Table Representation Learning Workshop)**.
- [2019] *L. Duong, CDV Hoang, T.Q. Pham, et al.* An Adaptable Task-Oriented Dialog System for Stand-alone Embedded Devices. **ACL 2019 (System Demonstrations)**.
- [2018] *CDV Hoang, P. Koehn, G. Haffari, T. Cohn.* Iterative Back-Translation for Neural Machine Translation. **WNMT @ ACL 2018**.
- [2017] *CDV Hoang, G. Haffari, T. Cohn.* Towards Decoding as Continuous Optimization in Neural Machine Translation. **EMNLP 2017**.
- [2016] *T. Cohn, CDV Hoang, E. Vymolova, K. Yao, C. Dyer, G. Haffari.* Incorporating Structural Alignment Biases into an Attentional Neural Translation Model. **NAACL HLT 2016**.
- [2016] *CDV Hoang, G. Haffari, T. Cohn.* Incorporating Side Information into Recurrent Neural Network Language Models. **NAACL HLT 2016 (Short)**.
- [2014] *CDV Hoang, A. Aw, H.-N. Nguyen Thi.* A Rule-Augmented Statistical Phrase-based Translation System. **ACL 2014 (System Demo)**.
- [2010] *CDV Hoang, M.-Y. Kan.* Towards Automated Related Work Summarization. **COLING 2010**.

Awards & Recognition

- **Best Long Paper Award** — ALTA 2016 & ALTA 2018
- **Google Australia PhD Travel Scholarship** — EMNLP 2017
- **ASEAN Outstanding Engineering Achievement Award** — Prime Minister's Office & IES Singapore, 2015 — project "Speak to Me in My Language" represented Singapore at the ASEAN congress
- **Melbourne International Fee Remission Scholarship & Melbourne International Research Scholarship** — University of Melbourne, 2015
- **Japanese Government (MEXT) Scholarship** — PhD Program, National Institute of Informatics, Tokyo, 2008
- **NUS Graduate Research Scholarship** — National University of Singapore, 2008
- **Outstanding Young Lecturer Award** — Vietnam National University (VNU-HCM), 2008