

# CARMEN S. CHUI

## Ph.D. Candidate

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## SUMMARY

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I am a final year Ph.D. candidate specializing in knowledge representation and modelling, as well as the design and analysis of first-order ontologies. My current research involves the design of a molecular structure ontology for medicinal chemistry in first-order logic, as well as providing model construction techniques for drug discovery. I hope to acquire research, teaching, and working experience in an environment where my skills and educational foundation can be further developed.

## RESEARCH INTERESTS

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- Ontology design, mapping, integration, and verification
- Knowledge representation & modelling
- Automated reasoning of first-order ontologies
- Applications of ontologies to data and knowledge integration
- Engineering education

## EDUCATION

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### Ph.D. in Industrial Engineering

09/2013–present

🎓 University of Toronto

📍 Toronto, Canada

- Dissertation: "A Molecular Structure Ontology for Medicinal Chemistry"
- Adviser: [Michael Grüninger](#)
- Committee: [Mark Fox](#), [Michael Grüninger](#), [L.H. Shu](#)
- Completed the [Prospective Professors in Training \(PPIT\) Program](#) in 2018

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### M.A.Sc. in Industrial Engineering

09/2011–08/2013

🎓 University of Toronto

📍 Toronto, Canada

- Dissertation: "[Axiomatized Relationships Between Ontologies](#)"
- Adviser: [Michael Grüninger](#)
- Committee: [Mark Fox](#), [Michael Grüninger](#), [L.H. Shu](#)
- Received [Teaching Fundamentals \(TF\) Certificate](#) from the Teaching Assistants' Training Program (TATP) in 2012

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### B.A.Sc. (with honours) in Industrial Engineering

09/2007–06/2011

🎓 University of Toronto

📍 Toronto, Canada

- Information Systems option stream
- Fourth year research thesis: "Reasoning About Changes"

## PUBLICATIONS

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- Google Scholar page: <https://scholar.google.ca/citations?user=R1gx074AAAAAJ>
- DBLP page: <http://dblp2.uni-trier.de/pers/hd/c/Chui:Carmen>

### Peer-Reviewed Conference Proceedings (Full Papers)

- [C1] Grüninger, M., Aameri, B., **Chui, C.**, Hahmann, T., Ru, Y., “Foundational Ontologies for Units of Measure”. In: *Formal Ontology in Information Systems - Proceedings of the 10th International Conference, FOIS 2018, Cape Town, South Africa, 19-21 September 2018*. Acceptance Rate: 29.2% (14 papers of 48 submissions). **Won Distinguished Paper Award**. 2018, pp. 211–224. URL: <https://doi.org/10.3233/978-1-61499-910-2-211>.
- [C2] **Chui, C.**, Grüninger, M., “A Molecular Structure Ontology for Medicinal Chemistry”. In: *Formal Ontology in Information Systems - Proceedings of the 9th International Conference, FOIS 2016, Annecy, France, July 6-9, 2016*. Acceptance Rate: 30.9% (25 papers of 80 submissions). 2016, pp. 285–298. URL: <http://dx.doi.org/10.3233/978-1-61499-660-6-285>.
- [C3] **Chui, C.**, Grüninger, M., “Mathematical Foundations for Participation Ontologies”. In: *Formal Ontology in Information Systems - Proceedings of the Eighth International Conference, FOIS 2014, September, 22-25, 2014, Rio de Janeiro, Brazil*. Acceptance Rate: 29.6% (24 papers of 81 submissions). 2014, pp. 105–118. URL: <http://dx.doi.org/10.3233/978-1-61499-438-1-105>.
- [C4] **Chui, C.**, Grüninger, M., “Merging the DOLCE and PSL Upper Ontologies”. In: *KEOD 2014 - Proceedings of the International Conference on Knowledge Engineering and Ontology Development, Rome, Italy, 21-24 October, 2014*. Acceptance Rate: 18% (78 submissions). An updated and revised version of this paper appears in [B1]. **Nominated for Best Student Paper Award**. SciTePress, 2014, pp. 16–26. ISBN: 978-989-758-049-9. URL: <https://doi.org/10.5220/0005027100160026>.
- [C5] Grüninger, M., Hahmann, T., Katsumi, M., **Chui, C.**, “A Sideways Look at Upper Ontologies”. In: *Formal Ontology in Information Systems - Proceedings of the Eighth International Conference, FOIS 2014, September, 22-25, 2014, Rio de Janeiro, Brazil*. Acceptance Rate: 29.6% (24 papers of 81 submissions). 2014, pp. 9–22. URL: <https://doi.org/10.3233/978-1-61499-438-1-9>.

### Peer-Reviewed Workshop Proceedings (Full Papers)

- [W1] **Chui, C.**, Grüninger, M., “Verification and Modularization of the DOLCE Upper Ontology”. In: *Proceedings of the Joint Ontology Workshops 2017 Episode 3: The Tyrolean Autumn of Ontology, Bozen-Bolzano, Italy, September 21-23, 2017*. Sept. 2017. URL: [http://ceur-ws.org/Vol-2050/FOUST\\_paper\\_1.pdf](http://ceur-ws.org/Vol-2050/FOUST_paper_1.pdf).
- [W2] Grüninger, M., **Chui, C.**, Katsumi, M., “Upper Ontologies in COLORE”. In: *Proceedings of the Joint Ontology Workshops 2017 Episode 3: The Tyrolean Autumn of Ontology, Bozen-Bolzano, Italy, September 21-23, 2017*. Sept. 2017. URL: [http://ceur-ws.org/Vol-2050/FOUST\\_paper\\_2.pdf](http://ceur-ws.org/Vol-2050/FOUST_paper_2.pdf).

- [W3] Aameri, B., Grüninger, M., **Chui, C.**, “Anti-Modules”. In: *Proceedings of the Joint Ontology Workshops 2016 Episode 2: The French Summer of Ontology co-located with the 9th International Conference on Formal Ontology in Information Systems (FOIS 2016)*. Annecy, France, July 2016. URL: <http://ceur-ws.org/Vol-1660/womocoe-paper2.pdf>.
- [W4] **Chui, C.**, Grüninger, M., van Berkel, M., “Ontology Mapping in an e-Commerce Application”. In: *Formal Ontologies Meet Industry - 7th International Workshop, FOMI 2015, Berlin, Germany, August 5, 2015, Proceedings*. Acceptance Rate: 61.1% (11 papers of 18 submissions). 2015, pp. 25–38. URL: [https://doi.org/10.1007/978-3-319-21545-7\\_3](https://doi.org/10.1007/978-3-319-21545-7_3).

## Book Chapters

- [B1] **Chui, C.**, Grüninger, M., “Techniques for Merging Upper Ontologies”. In: *Knowledge Discovery, Knowledge Engineering and Knowledge Management - 6th International Joint Conference, IC3K 2014, Rome, Italy, October 21-24, 2014, Revised Selected Papers*. 2014, pp. 273–292. URL: [https://doi.org/10.1007/978-3-319-25840-9\\_18](https://doi.org/10.1007/978-3-319-25840-9_18).

## Prepared Manuscripts

- [M1] **Chui, C.**, Grüninger, M., “Drug Discovery as Model Construction”. To be submitted to the [Journal of Cheminformatics](#).

## Scholarly Presentations & Talks

- [S1] *An Ontological Approach to Medicinal Chemistry*. Presented to The Lautens Research Group in the Department of Chemistry at the University of Toronto. July 2017.
- [S2] *A Molecular Structure Ontology for Medicinal Chemistry*. Presented [C2] at the Formal Ontology in Information Systems (FOIS 2016) in Annecy, France. July 2016.
- [S3] *Anti-Modules*. Presented [W3] at the Proceedings of the Joint Ontology Workshops (JOWO 2016). July 2016.
- [S4] *Merging the DOLCE and PSL Upper Ontologies*. Presented [C4] at the Proceedings of the International Conference on Knowledge Engineering and Ontology Development (KEOD 2014). Oct. 2014.
- [S5] *Breaking Down DOLCE: Overview of the Verification of the DOLCE Ontology*. Presented at the Toronto Ontology Festival (TOFFEE). Aug. 2012.
- [S6] *Overview of Current Research Projects*. Presented at the [Toronto Semantic Web Meetup Group: What's Happening in the Semantic Technologies Lab?](#) Event. Oct. 2012.
- [S7] *Reasoning with Ontology Mappings*. Presented at the MIE Scientific Writing Course (run by Debby Repka). July 2012.

## TEACHING AND MENTORING EXPERIENCE

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Teaching Assistant

 University of Toronto

09/2011–present

 Toronto, Canada

In addition to invigilating faculty-wide exams, I designed and conducted tutorials, held office hours, graded progress and final reports, and designed programming labs and quizzes, and graded assignments, tests, and exams.

At the *undergraduate* level:

- MIE191: Introduction to Mechanical and Industrial Engineering *Winter 2015–2017*
  - Taught by [Professor Pierre Sullivan](#)
- MIE350: Design & Analysis of Information Systems *Fall 2011–2017*
  - Taught by Professors [Reza Samavi](#) (Fall 2011) and [Michael Grüninger](#) (Fall 2012 onwards)
- MIE457: Knowledge Modelling & Management *Winter 2015–2018*
  - Taught by [Professor Michael Grüninger](#)

At the *graduate* level:

- MIE1505: Enterprise Modelling *Fall 2016*
  - Taught by [Professor Michael Grüninger](#)

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## Client/Student Mentor

**01/2017–04/2017**

 University of Toronto

 Toronto, Canada

As part of the APS 1203/1204 course offered with the Prospective Professors in Training (PPIT) program, I was a mentor for a group of six first-year undergraduate students taking their Engineering Strategies & Practice II (APS 112) course. The group's project is to redesign mathematics in the classroom to make the subject more engaging and interesting for high-school students. We have been featured in the UofT Engineering News in the following article: <http://news.engineering.utoronto.ca/engineering-educational-experience/>.

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## RESEARCH AND INDUSTRY EXPERIENCE

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### Graduate Research Assistant

**09/2011–present**

 [Semantic Technologies Lab](#), University of Toronto


 Toronto, Canada

- Help specify the metadata and formalize logical methods to relate ontologies to one another within the [COMmon Logic Ontology REpository \(COLORE\)](#) project
- Assisted with *local* International Association for Ontology & Its Application (IAOA) events:
  - [IAOA Summer Institute on Upper Ontologies 2017](#)
  - [Toronto Ontology Festival \(TOFFEE\) 2012](#)

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### Database Analyst

**05/2010–08/2010**


 [Mercer \(Canada\) Ltd.](#)

 Toronto, Canada

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### Web Application Support Specialist, Database Analyst

**05/2009–08/2009**


 [Mercer \(Canada\) Ltd.](#)

 Toronto, Canada

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### Web Application Support Specialist

**05/2008–08/2008**

 [Mercer \(Canada\) Ltd.](#)

 Toronto, Canada

Student Intern (Cell Culture of Myometrial Cells)

 Lunenfeld-Tanenbaum Research Institute, Mount Sinai Hospital

06/2006–08/2006

 Toronto, Canada

## TECHNICAL SKILLS

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**Programming & Markup Languages** CSS, HTML, Java, JavaScript, PHP, Python, SQL,  $\text{\LaTeX}$ , Visual Basic, XHTML, and XML.

**Knowledge Modelling/Representation Languages** BPMN, Common Logic, Description Logic, First-Order Logic, IDEF, OWL, Petri Nets, Prolog, Prover9, RDF/S, Simul8, SPARQL, SWRL, and UML.

**Computer Applications** Adobe Creative Suite (Illustrator, Photoshop), Eclipse, Intalio BPMS,  $\text{\LaTeX}$ , MATLAB, Microsoft Office (Access, Excel, PowerPoint, Project, Visio, & Word), Microsoft SQL Server, Minitab, Prolog, Protégé, Prover9-Mace4, and Vampire.

**Operating Systems** Macintosh OS X, Linux, Microsoft Windows.

## AWARDS AND HONOURS

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*Distinguished Paper Award at FOIS 2018 for [C1]* September 2018

*Nominated for Best Student Paper award at KEOD 2014 for [C4]* October 2014

*Mechanical And Industrial Engineering Admission Scholarship (\$1,000)* 2007

*Faculty Of Applied Science And Engineering Admission Scholarship (\$1,000)* 2007

## PROFESSIONAL ACTIVITIES & ASSOCIATIONS

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*International Association for Ontology & Its Applications (IAOA)* 2011–present

*ONTOLOG Forum* 2011–present

*Ontario Society of Professional Engineers (OSPE)* 2011–present

*Institute of Electrical and Electronics Engineers (IEEE)* 2011–present

*Institute of Industrial Engineers (IIE)* 2011–present

## PERSONAL

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**Languages** English (native), French (limited working proficiency)

**Citizenship** Canadian