Carmen S. Chui, Ph.D.

she/her/hers

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http://carmenchui.github.io

Profile

- Extensive background in ontology engineering, knowledge representation, and automated reasoning in various disciplines (anthropology, chemistry, e-commerce, finance, linguistics, manufacturing, and mathematics).
- Familiarity with UML, FOL, DL, RDF/S, OWL, SPARQL, SWRL, SHACL.
- Excellent communication, teamwork, writing, and management skills developed through previous academic and industry positions.
- Canadian citizen fluent in English with working proficiency in French.

Education

Ph.D. in Industrial Engineering, University of Toronto, June 2019.

M.A.Sc. in Industrial Engineering, University of Toronto, November 2013.

B.A.Sc. (with Honours) in Industrial Engineering, University of Toronto, June 2011.

Experience

Senior Business Data Architect — Toronto, ON
The Bank of Nova Scotia (Scotiabank) — *December 2020 – present*

- Part of the Customer Insights, Data & Analytics (CIDA) team in the corporate Data Office.
- Project lead on the Scotiabank Business Information Model (SBIM).

Postdoctoral Fellow — Toronto, ON
University of Toronto (UofT), Royal Bank of Canada (RBC) — *April 2019 – November 2020*

- Supervised by Prof. Michael Grüninger of the Semantic Technologies Lab and Janette Wong at RBC.
- Collaborated with RBC's Data & Analytics (DNA) and Location Intelligence (LI) teams to analyze, develop, and apply ontologies for various business intelligence projects:

May 2020 – Nov. 2020	Worked with the Advanced Analytics Team in RBC to examine ways how ontologies and machine learning can help with preparing and extracting relevant data for various consumption needs in the bank. Developed an ontology and semantic parsing framework for a proof-of-concept (POC) artificial intelligence engine to do query expansion.
May 2020 – Nov. 2020	Explored the use of the Financial Industry Business Ontology (FIBO) for quality checking loans data, as well as determining whether FIBO can be extended via ontology modules for the Bank's needs.
July 2019 – August 2019	(Supervised by James Liao at RBC) Developed a prototype to convert raw loan end-of-day-contract datasets into RDF using open-source tools, and to map the Bank's loan concepts as RDF classes and properties.

April 2019 – June 2020 Developed a kinship ontology in first-order logic (Common Logic) based on work done in anthropology for business intelligence projects. Results published at FOIS 2020.

Graduate Research Assistant (M.A.Sc., Ph.D.) Toronto, ON
University of Toronto *September 2011 – March 2019*

- Specified the metadata and formalize logical methods to relate ontologies to one another within the COmmon Logic Ontology REpository (COLORE) project: http://colore.oor.net/
- Verified and validated ontologies using formal logical techniques and mathematical theories (algebra, geometry, graph theory).
- Published results at the FOIS, FOMI, JOWO and KEOD conferences and workshops, and in the Applied Ontology journal.
- In addition to proctoring faculty-wide examinations, I was the head Teaching Assistant for the Introduction to Mechanical & Industrial Engineering (MIE191), Design & Analysis of Information Systems (MIE350), Knowledge Modelling & Management (MIE457), and Enterprise Modelling (MIE1505) courses.

Selected Recent Publications

For the full list, please see: https://scholar.google.ca/citations?user=R1gxO74AAAAJ

[1] B. Aameri, **C. Chui**, M. Grüninger, T. Hahmann, and Y. Ru. "The FOUnt Ontologies for Quantities, Units, and the Physical World". In: *Applied Ontology* 15.3 (2020), pp. 313–359.

[2] **C. Chui**, M. Grüninger, and J. Wong. "An Ontology for Formal Models of Kinship". In: *Formal Ontology in Information Systems - Proceedings of the 11th International Conference, FOIS 2020.* 2020, pp. 92–106.

[3] M. Grüninger, **C. Chui**, Y. Ru, and J. Thai. "A Mereology for Connected Structures". In: *Formal Ontology in Information Systems - Proceedings of the 11th International Conference, FOIS 2020.* 2020, pp. 171–185.

Technical Skills

Programming & Markup Languages:

CSS, HTML, Java, JavaScript, PHP, Python, SQL, TEX, Visual Basic, and XML.

Knowledge Modelling & Representation Languages:

Business Process Model and Notation (BPMN), Common Logic (CL), Description Logic (DL), First-Order Logic (FOL), Integration DEFinition (IDEF), Web Ontology Language (OWL), Petri Nets, Prolog, Resource Description Framework/Schema (RDF/S; Knowledge Graph), Shapes Constraint Language (SHACL), SPARQL Protocol and RDF Query Language (SPARQL), Semantic Web Rule Language (SWRL), Thousands of Problems for Theorem Provers (TPTP), and Unified Modeling Language (UML).

Ontologies:

Basic Formal Ontology (BFO), Descriptive Ontology for Linguistic and Cognitive Engineering (DOLCE), Dublin Core (DC), Financial Industry Business Ontology (FIBO), Friend-of-a-Friend (FOAF), gist, GoodRelations, Process Specification Language (PSL), Schema.org, Simple Knowledge Organization System (SKOS), Suggested Upper Merged Ontology (SUMO).

Theorem Provers, Reasoners, Model Builders, & Ontology Tools:

Paradox, Protégé, Prover9-Mace4, SWI-Prolog, and Vampire.