Bryan-Elliott Tam

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Education

Universiteit Gent 2022 — Present
Doctorate, Computer Science Engineering *Gent, Belgium*

- Research Topic: Decentralized Web Querying of Knowledge Graphs Databases
- Additional Responsibilities:
  - Teaching assistant for the Knowledge Graphs course
  - Member of the program committee for the SEMANTiCS 2025 Developers Workshop

Université Laval 2020 — 2022
Master of Sciences, Computer Science *Sainte-Foy, Qc, Canada*

- Thesis topic: Digital Twin to Improve Training and Performance of Forestry Operators

Université Laval 2015 — 2019
Bachelor of Engineering, Mechanical Engineering *Sainte-Foy, Qc, Canada*

Skills

- **Programming Languages**: TypeScript, Prolog, Rust, Python, Go, HTML/CSS, SMT-LIB, C++
- **Natural Languages**: French, English

Work Experiences

Research Assistant May 2022 — September 2022
Université Laval *Sainte-Foy, Qc, Canada*

Designed a search engine to assist architecture researchers in locating relevant literature references. Technologies used: Go, JavaScript, HTML, CSS, and Python.

Research Assistant May 2020 — September 2020
Université Laval *Sainte-Foy, Qc, Canada*

Transformed a 2D excavator localization system into a 3D system using map data and machine turret's position. Implemented using C++ and Python.

IoT and Web Developer October 2018 — March 2020
Systèmes Vireo *Sainte-Foy, Qc, Canada*

Design of an IoT system for managing hydroponic components in an urban agriculture context at a startup. Responsibilities included embedded systems programming (C++, PlatformIO, MQTT, KiCad), full-stack web development (React, TypeScript, Node.js, REST/GraphQL APIs, MongoDB, Node-RED), and on-site system installation.

Intern May 2018 — August 2018
Systèmes Vireo *Sainte-Foy, Qc, Canada*

Designed electronic systems for hydroponic applications, including schematic design with KiCad and development of a management interface using Python and PyQt.

Open Source Projects

Comunica https://github.com/comunica/comunica

"A knowledge graph querying framework for JavaScript." During my PhD, I contributed to various modules, particularly focusing on decentralized querying.

pkg.pl https://github.com/bakaq/pkg.pl

"An experimental package manager for Scryer Prolog." Contributed to enhancing dependency fetching and developing a lockfile system to improve reproducibility.

Freetube https://github.com/FreeTubeApp/FreeTube

Freetube is a cross-platform YouTube client focused on privacy. Contributions include developing modules for displaying viewing statistics (similar to "Stats for Nerds"), searching viewing history and playlists, implementing in-app media downloading, and enhancing the UI styling of various elements.

Academic projects

Patients triage with combinatorial optimization methods (Combinatorial Optimization)

Worked with another student to solve a combinatorial optimization problem involving hospital patient triage using MiniZinc and a local search algorithm implemented in Go.

- source code

Code analysis with Z3 (Security and Formal Method)

Developed a program in Python using the Z3 library to perform static code analysis. Implemented analyses including path condition detection, automatic test generation, dead code detection, pre- and post-condition and invariant analysis, equivalence analysis, and security analysis.

- source code

Epicurean Cycling (Advanced Database)

Collaborated with another student to develop an application for planning bike rides that meet specified distance requirements and include stops near selected types of restaurants. Technologies used included Go, Docker, MongoDB, and Neo4j.

- source code

Personal Projects

Shin Megami Tensei III demon summoning planner https://github.com/constraintAutomaton/smt3-fusion-kb-pl-generator

Developed a fusion planning tool for Shin Megami Tensei III by converting a JSON dataset into a knowledge graph and a Prolog knowledge base, leveraging Prolog reasoning to generate optimized fusion plans.

Citation to wallpaper https://gitlab.com/constraintAutomaton/citation-wallpaper-linkded-data

Developed software that converts citations stored in a knowledge graph into SVG wallpapers by enriching the data with additional information, such as author details, retrieved from DBpedia.

Distance sensors with laser and camera

Design of a laser distance sensor with a webcam. The calculations were Performed with Opencv(python) and the graphical interface with pyQt.

- video
- source code

Manga Web Scraper

Design of a Web Scraper to download manga chapters and convert them to PDF. The graphical interface is done with pyQt.

- video
- source code

Publications

- Tam, Bryan-Elliott, Thierry Eude, Luc Lebel, and Philippe Giguère. 2025. "Toward a Digital Twin to Improve the Training and Performance of Forestry Operators". *International Journal of Forest Engineering*, May, 1–11. https://doi.org/10.1080/14942119.2025.2500118
- Tam, Bryan-Elliott, Ruben Taelman, Pieter Colpaert, and Ruben Verborgh. 2024. "Opportunities for Shape-Based Optimization of Link Traversal Queries". In *Proceedings of the 16th Alberto Mendelzon International Workshop on Foundations of Data Management*. https://arxiv.org/abs/2407.00998v2
- Tam, Bryan-Elliott, Ruben Taelman, Julian Andres Rojas Melendez, and Pieter Colpaert. 2024. "Optimizing Traversal Queries of Sensor Data Using a Rule-Based Reachability Approach". In *Posters, Demos, And Industry Tracks: From Novel Ideas to Industrial Practice, Co-Located with 23nd International Semantic Web Conference (ISWC 2024).*, 5. Baltimore, USA. https://arxiv.org/abs/2408.17157
- Tam, Bryan-Elliott. 2023. "Introducing Collaborative Link Traversal Query Processing in the Context of Structured Decentralized Environments". In *Iswc2023, The International Semantic Web Conference*, 8. Athens, Greece. https://constraintautomaton.github.io/Introducing-Collaborative-Link-Traversal-Query-Processing/
- Tam, Bryan-Elliott. 2022. "Jumeau Numérique (Digital Twin) Pour La Formation Et Le Suivi De Performance D'opérateurs De Machineries Lourdes". *Thèses Et Mémoires, Université Laval*. https://hdl.handle.net/20.500.11794/100384