

# Khaled Sellami

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Address: Québec, QC

## EDUCATION

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- **Laval University** Québec, QC  
*Software Engineering PhD* May 2021 - Current  
*Subject: Decomposing monolithic applications into a microservices architecture using artificial intelligence techniques.*
- **National School of Computer Science Tunis** Tunis, Tunisia  
*Engineering diploma in Computer Science (Software Engineering specialization)*  
*Research Master's diploma in Smart Systems* Sep 2017 - Sep 2020  
*Ranked fifth on graduation with a very good grading.*
- **Preparatory Institute of Engineering of Tunis** Tunis, Tunisia  
*Preparatory Program in mathematics and physics* Sep 2015 - Jun 2017  
*National Rank 117 ( out of 1400 approximately).*

## HONORS AND PUBLICATIONS

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- **Scholarship:** Citoyenne et citoyens du monde BCCM-FSG volet excellence.
- **Publication:** Sellami, K., Saied, M.A. Extracting microservices from monolithic systems using deep reinforcement learning. *Empir Software Eng* 30, 1 (2025). <https://doi.org/10.1007/s10664-024-10547-4>
- **Publication:** Sellami, K., Saied, M.A., Ouni, A., Abdalkareem, R. (2022). Combining Static and Dynamic Analysis to Decompose Monolithic Application into Microservices. In: Troya, J., Medjahed, B., Piattini, M., Yao, L., Fernández, P., Ruiz-Cortés, A. (eds) *Service-Oriented Computing. ICSOC 2022. Lecture Notes in Computer Science*, vol 13740. Springer, Cham. [https://doi.org/10.1007/978-3-031-20984-0\\_14](https://doi.org/10.1007/978-3-031-20984-0_14)
- **Publication:** Khaled Sellami, Ali Ouni, Mohamed Aymen Saied, Salah Bouktif, Mohamed Wiem Mkaouer, Improving microservices extraction using evolutionary search, *Information and Software Technology*, Volume 151, 2022, 106996, ISSN 0950-5849, <https://doi.org/10.1016/j.infsof.2022.106996>.
- **Publication:** Khaled Sellami, Mohamed Aymen Saied, and Ali Ouni. 2022. A Hierarchical DBSCAN Method for Extracting Microservices from Monolithic Applications. In *The International Conference on Evaluation and Assessment in Software Engineering 2022 (EASE 2022)*. Association for Computing Machinery, New York, NY, USA, 201–210. <https://doi.org/10.1145/3530019.3530040>.

## SKILLS

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- **Languages:** English, French, Arabic.
- **Programming Languages:** Python (Pandas, Scikit-Learn, Transformers, Llama.cpp, Ray, Pytorch, PySpark, Plotly, Django, Scikit-Image), Java, C#, C/C++, Vue.js, Shell Scripting.
- **Data Science:** Deep Learning, Reinforcement Learning, Clustering, Time Series Forecasting, Large Language Models, Data Visualization, Traditional Machine Learning algorithms.
- **Other:** Docker, Kubernetes, Git, SQL, Neo4j, LaTeX, UML.

## EXPERIENCE

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- **Laval University** Québec, QC  
*Lecturer* Sep 2024 - Current
  - **Cloud Native Applications and DevOps:** Technologies used: Docker, Kubernetes.
- **Hydro-Québec** Québec, QC  
*Data Science Research intern* May 2023 - Oct 2023
  - Collaborating with a team to build a workload forecasting model.
  - Analyzing the historical data in order to extract meaningful insights and present them to the team.
  - Refactoring and improving the architecture of the project.
  - **Technologies used:** Python: Pandas, Darts, Dash, GreyKite.
- **Laval University** Québec, QC  
*Teaching Assistant* Jan 2022 - May 2024
  - **Operating Systems for Engineers:** Technologies used: C/C++, Linux, Virtualization (VMware, VirtualBox).
  - **Cloud Native Applications and DevOps:** Technologies used: Docker, Kubernetes.

- **Cognira** Tunis, Tunisia  
*Junior Data Scientist* Nov 2020 - Apr 2021
  - Daily analysis of the recent sales and forecasting data.
  - Weekly discussions with the client about the forecasting results and the impacted sales.
  - Evaluating the performance of the forecasting systems and optimizing their hyper-parameters.
  - Developing and improving the internal analysis tools.
  - **Technologies used:** Python (PySpark, Pandas, Dash, Plotly, GeoPandas), Linux, Oracle RDF.
- **Vilmorin Mikado** Angers, France  
*R&D Intern* Mar 2020 - Aug 2020
  - **End of Studies Internship:** Automatic classification of sunflower seeds based on X-ray images.
  - Designing a Deep Learning model that can classify the defects in sunflower seeds.
  - Processing and segmentation of DICOM images (X-ray) that includes batches of sunflower seed samples.
  - Developing a software that integrates the image processing module and the classification model and that provides multiple functionalities increasing the productivity of the users.
  - **Technologies used:** Python (Pandas, TensorFlow, Scikit Learn, Scikit Image, PySide2), Qt Creator.
- **Teamwill Consulting** Tunis, Tunisia  
*Intern* Jul 2019 - Aug 2019
  - Developing a microservice that exports and models relational databases into graph databases.
  - Developing a prototype microservice that enables automatic forecasting or clustering.
  - **Technologies used:** Python (Flask, SQLAlchemy, scikit-learn, statsmodels), Neo4J, Docker, Oracle database.
- **Logidas** Tunis, Tunisia  
*Intern* Jul 2018 - Aug 2018
  - Building a functionality that reads, filters and analyzes a Paradox database and exports the results into well formatted Excel files.
  - **Technologies used:** Delphi, Paradox database.

## ACADEMIC AND RESEARCH PROJECTS

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- **MicroAnalyzer:** A collection of static analysis tools in various programming languages (Java, C#, Python, JavaScript, Ruby, Go). As part of a larger research paper, this project implements a set of parsers that extract code snippets in microservices based applications for multiple programming languages. (Jun '24)
- **RLDec:** Implementation of a published Reinforcement Learning based monolith to microservices decomposition approach, built using Ray-RLib, Pytorch and standard scientific libraries (Pandas, Scikit-Learn). (May '23)
- **NEAT agent (Evolutionary Algorithm):** Implementation of the Google Chrome Dinosaur game in Pygame and a NEAT (NeuroEvolution) agent that learns it. (Jul '19)
- **DQN TicTacToe agent(Reinforcement Learning):** A Deep Reinforcement Learning agent that learns how to play TicTacToe. (Jun '19)
- **Recommendation System of local food recipes(Recommendation Systems and Django):** Design and Development Project : Development of a recipe recommendation system using their ingredient data, utilizing data mining techniques to process the ingredients and machine learning techniques to build the recommender and a social network hosting the system using the Django framework. Selected in top 10 school projects in 2019. (Jan '19 - Apr '19)
- **Compiler (C++, Computer theory):** A compiler built on C++. ( Apr '19)

## EXTRACURRICULAR ACTIVITIES

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- **Club ENSI Junior Enterprise** 2017 - 2020  
*Active member and project lead*
- **Google Developer Group ENSI** 2017 - 2018  
*Executive board member and Google opportunities manager*
- **Applied mathematics workshop - Youth For Science** 2018  
*Instructor for middle-schoolers*