IOANNIS XARCHAKOS

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Research Interests

My research interests lie on the intersection of data management and computer vision focused on video analytics. In particular, I am interested on developing declarative query processing systems for streaming video.

Education

Doctor of Philosophy (PhD) in Computer Science — Jan 2019 -
University of Toronto (UofT), Toronto, Canada
Grade: 3.8/4.0
Advisor: Prof. Nick Koudas

Master of Science in Computer Science (PhD stream) — Sep 2017 - Jan 2019
University of Toronto (UofT), Toronto, Canada
Thesis: "Video Monitoring Queries"

Bachelor of Science in Computer Science — Sep 2011 - Sep 2016
Athens University of Economics and Business (AUEB), Athens, Greece
Thesis: "Social Network Analysis" — Advisor: Prof. Vasilis Vassalos

Professional Experience

Computer Vision Engineer — Feb 2022 -
Fullbeauty Brands

Virtual Try-On
- Develop a multi-garment virtual try-on solution to generate try-on images of the recommended outfits by fine-tuning Stable Diffusion inpainting U-Net

Tiled Cloth Image Generation from Dressed Person Image
- Fine-tuned Stable Diffusion inpainting U-Net to generate tiled cloth images from a person in any pose

Product Attribution Engine
- Developed a multi-modal (product image, product description) classification architecture for generating attribute values (i.e., product color, sleeve length) of fashion products

Outfit Recommendation Engine
- Developed a multi-modal (product image, product description) outfit recommendation engine by learning an embedding space where compatible products lie closer together

Data Scientist (contractor) Apr 2016 - Nov 2016
Workable

The development process included:
Feature Engineering (Text Analysis, Web Crawling),
Supervised Machine Learning (XGBoost, Neural Networks),
Feature (Filter, Embedded Methods), and Model Selection.
Performance: Precision (Company's goal): 96.4% (95%) - Recall: 74% (60%)

Publications

- Coping With Data Drift in Online Video Analytics, EDBT 2025
  Ioannis Xarchakos, Nick Koudas
- Querying for Interactions, IEEE TKDE 2023
  Ioannis Xarchakos, Nick Koudas
- Querying for Interactions, IEEE ICDE 2022
  Ioannis Xarchakos, Nick Koudas
- Video Monitoring Queries, IEEE TKDE 2021
  Nick Koudas, Raymond Li, Ioannis Xarchakos
- SVQ++: Querying for Object Interactions in Video Streams,
  ACM SIGMOD 2020
  Daren Chao, Nick Koudas, Ioannis Xarchakos
- Video Monitoring Queries, IEEE ICDE 2020
  Nick Koudas, Raymond Li, Ioannis Xarchakos
- SVQ: Streaming Video Queries, ACM SIGMOD 2019
  Ioannis Xarchakos, Nick Koudas
- Enabling Data Integration Using MIPMap, DILS 2017
  G Stoilos, D Trivela, V Vassalos, T Venetis, I Xarchakos

Research Experience

Graduate Research Assistant Sep 2017 -
University of Toronto, Toronto, ON, Canada
Project title: Streaming Video Queries — Advisor: Prof. Nick Koudas

During my PhD studies, I developed:

- A framework for performing SQL-like queries on video streams
- Convolutional nets for processing video streams 2 orders of magnitude faster than the state-of-the-art computer vision models
- Non-parametric algorithms for detecting and recovering (model selection, re-training) from concept drift in video streams

Research Assistant Jan 2017 - Sep 2017
Athens University of Economics and Business, Athens, Greece
Project title: Human Brain Project — Advisor: Prof. Vasilis Vassalos

Implemented incremental integration techniques and crowdsourcing functionality in a bio-medical clinical data system

Undergraduate Researcher Jul 2015 - Apr 2016
Athens University of Economics and Business, Athens, Greece
Project title: Social Network Analysis — Advisor: Prof. Vasilis Vassalos

Developed centrality algorithms in graph processing systems (Neo4j, Apache Giraph, Stanford Network Analysis Platform) using large-scale optimization techniques

Teaching Experience

Teaching Assistant (University of Toronto)
- Database System Technology (7 terms)
- Introduction to Databases (4 terms)
- Introduction to Computer Programming II (1 term)
- Introduction to Computer Programming I (1 term)
- Foundations of Computer Science I (1 term)
- Foundations of Computer Science II (1 term)

Teaching Assistant (Athens University of Economics and Business)
Large Scale Data Management (Master of Data Science course)

Honors & Awards

University of Toronto
- Doctoral Completion Award (2022, 2023) - Department of Computer Science
- Guaranteed PhD funding (2019-2022) - Department of Computer Science
- Guaranteed MSc funding (2017-2019) - Department of Computer Science

Athens University of Economics and Business
- Performance Award (2011-2012) - Department of Informatics

Service

University of Toronto
Department of Computer Science faculty recruitment round table host
- System and Databases candidates (2021, 2022)

Reviewer
- 27th ACM SIGKDD Conference on Knowledge Discovery & Data Mining (KDD 21)

Programming Skills

Programming Languages: Python, Go, Java
Frameworks: PyTorch, Keras (TensorFlow), OpenCV, Scikit-learn
Other: Git, Docker, Latex, PostgreSQL(PL/pgSQL), MongoDB, Linux (Unix)

Languages

Greek (native), English (Proficient)