TZIMOS
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0. ABOUT ME

I am a graduate of the School of Electrical and Computer Engineering of the Technical University of Crete. My interests are in the broad area of Big Data Management Systems, including distributed data stream processing, analytics over data streams, data synopses, approximate query processing, and distributed machine learning algorithms.

1. EDUCATION

Integrated Master Degree - School of Electrical and Computer Engineering Chania, Greece

- Technical University of Crete – Sept 2015 - Feb 2023
- Class Rank: 5.8%
- GRADE: 8.4/10
- GRADE (Computer Science): 9/10
- Thesis: "*Distributed and Online maintenance of Graphical Models in Apache Flink*"

2. CAREER - WORK EXPERIENCE

External researcher Jab 2023 – Present

- Technical University of Crete – Chania, Greece
- Research on online structure learning of Bayesian Networks and online maintenance of Bayesian Networks using Graphical Model Sketches.

Mandatory Military Service Jan 2022 – Nov 2022

- Office of Research and Informatics
- IT support
- Server and Networking infrastructure maintenance
- Computer maintenance and repair

Freelance Full Stack Engineer Jun 2022 – Aug 2022

- Database Management System (DBMS)
- Design the User Interface (UI)
- Frontend and Backend Technologies

3. TECHNICAL-RESEARCH SKILLS

Programming Languages: Java, Scala, Python, C, C++, MATLAB, R

Databases: SQL (MySQL, PostgreSQL), NoSQL (MongoDB, Cassandra)

Web-Application Development: HTML, CSS, JavaScript (JS), Docker, Kubernetes, REST APIs, Microservices, Google Cloud Platform (GCP)

Frameworks and Tools: Apache Flink, Apache Spark, Apache Storm, Map-Reduce (Hadoop), Apache Kafka, Apache Airflow, Apache NiFi, Pandas, NumPy, Redis, Git, Jenkins

Environments: Algorithms, Machine Learning, Artificial Intelligence, Distributed Stream Processing, Analytics over Data Streams, Data Synopses, Parameter Server, Server-Client architecture, Cloud-Fog Computing, Containerized Web-Applications, Time Series and Statistical Analysis, ETL Transformations, Software as a Service (SaaS), Multi-Threating, Continuous Integration and Deployment Operations (CI/CD), Bash and Batch Scripting, Sensor and IoT Networks, Unix Environments

4. RELEVANT PROJECTS

Distributed and Online Maintenance of Graphical Models Sept 2021 – Dec 2021

- Implementation of a general, extensible and scalable system for the online maintenance of the well-known graphical model, the Bayesian Network, and a special of this the Naïve Bayes Classifier in Apache Flink platform.
- We focus on the learning parameters of the Bayesian Network using the Maximum Likelihood Estimation (MLE) algorithm.
- The first objective is to accurately estimate the joint probability distribution of the Bayesian Network while providing user-defined error guarantees. The second objective focuses on using the minimum communication cost and at the same time implementing a system capable of scaling and handling high-dimensional, distributed, high-throughput, and rapid data streams.
- To solve this problem there are two approaches. The first approach uses approximate distributed counters, we implement two types of distributed counters, the first type refers to the randomized counters and the second one refers to the deterministic counters. The second approach is based on the use of the Functional Geometric Monitoring method. The second approach resulted in an improvement of 100-1000x in communication cost over the maintenance of exact MLEs and an improvement of 10x in communication cost over the first approach while providing estimates of joint probability distribution with nearly the same accuracy as obtained by exact MLEs.

Implementation of a General Method for Monitoring Arbitrary Queries Sept 2021 – Dec 2021

- Integration of the Functional Geometric Monitoring (FGM) method in the Apache Flink platform.
- Functional Geometric Monitoring is a technique that can be applied to any monitoring problem in order to perform distributed and scalable monitoring with minimal communication cost.
- The FGM method is a method that is independent of the monitoring problem, to achieve this the method uses a problem-specific family of functions termed safe functions.
- Finally, the FGM method can be naturally adapted under adverse conditions of the monitoring problem such as very tight monitoring bounds and the presence of skew in the distribution of data among the distributed nodes.

Real-Time Credit Card Fraudulent Detection Feb 2021 – Jun 2021

- Implementing a real-time fraud-detection system (FDS) for Credit Card Fraud Transactions using Adaptive Random Forest in the Apache Spark platform.
- Design a new system for detecting and monitoring online transactions using the Apache Spark processing engine and implementing an Adaptive Ensemble Classification Method, Radom Forest. The system has the property of scalability and is capable of handling high-throughput, high-speed and large (Big Data) data streams while providing accuracy of up to 92% on average.

Web-Application Deployment using Docker in the Google Cloud Platform Sept 2020 – Dec 2020

- Web-based application using the Docker container. Development of user and cloud interfaces. The application was developed on the Google Cloud platform.
- Development of user authentication mechanism using the OAuth protocol with KEYROCK IDM service and development of proxy mechanism using the PEP-PROXY WILMA service for the protection of backend containers from unauthorized users. Finally, the development of a publish-subscribe (Pub-Sub) mechanism using the Orion Context Broker service.
- Design of REST APIs from scratch for the communication of services with backend containers.

Database Management Systems Feb 2018 – Jun 2018

- Extract, Transformation and Load (ETL) transformations, data management, data recovery, trigger deployment and implementation of views using MySQL and PostgreSQL environments.
- Query optimization (optimize queries plans – joins orders, indexes, pipeline, relational algebra and normalization)
- Query performance monitoring and updated view under JDBC protocol.

TinyOS-3 Extensions Sept 2017 – Dec 2017

- Implementation of functional extensions of an operating system based on a virtual machine.
- Implementation of Multilevel Feedback Queue, Multilevel Thread Execution, Pipes and Sockets.