

Jad DARROUS | Curriculum Vitae

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My Ph.D. studies

Ph.D. Topic.....

- I have worked on scalable and efficient data management for building and running data-intensive services in clouds.
- We first study the management of virtual machine images and containers images as the main entry point for efficient service provisioning. Specifically, we focus on data placement and retrieval for these images in order to improve service provisioning in geographically-distributed clouds and Fog/Edge environments.
- Second, towards efficient Big Data processing in the cloud, we investigate *erasure coding* (EC) as a scalable yet cost-efficient alternative for replication in data-intensive clusters. In particular, we study the opportunities and the challenges in integrating erasure coding for online data analytics.

Research Project.....

- I was part of DISCOVERY Initiative (<http://beyondtheclouds.github.io>), a research project that explores the methodologies and algorithms needed to deploy and operate massively distributed cloud infrastructure.
- My advisors are Shadi Ibrahim and Christian Perez.
- I was a member of Avalon and Stack teams of Inria research center.

Publications in international conferences.....

- **Jad Darrous**, Shadi Ibrahim, Christian Perez, “Is it time to revisit Erasure Coding in Data-intensive clusters?” in *Proceedings of the 27th IEEE International Symposium on the Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS)* - Oct. 2019, Rennes, France.
- **Jad Darrous**, Thomas Lambert, Shadi Ibrahim, “On the Importance of Container Image Placement for Service Provisioning in the Edge” in *Proceedings of the 28th International Conference on Computer Communications and Networks (ICCCN)* - Jul. 2019, Valencia, Spain.
- **Jad Darrous**, Shadi Ibrahim, Amelie Chi Zhou, Christian Perez, “Nitro: Network-Aware Virtual Machine Images Management in Geo-Distributed Clouds” in *Proceedings of the 18th IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing (CCGrid)* - May. 2018, Washington DC, USA.

Posters in international conferences.....

- **Jad Darrous**, Shadi Ibrahim, “Enabling Data Processing under Erasure Coding in the Fog” in *The 48th International Conference on Parallel Processing (ICPP)* - Aug. 2019, Kyoto, Japan.

Software.....

- **Nitro — VMI management in geo-distributed clouds.** Nitro is a Virtual Machine Image (VMI) management system for geo-distributed clouds. Nitro reduces the network cost and optimizes the retrieval time when provisioning a virtual machine on a site where its image is not available locally. Nitro leverages deduplication to reduce the size of the image dataset, and thus, reduce network cost when transferring images. Importantly, Nitro incorporates a network-aware chunk scheduling algorithm that produces optimal scheduling for data retrieval. Codebase: 1500 LoC in Python. Publicly available at gitlab.inria.fr/jdarrous/nitro
- **Container image placement simulator in Edge environment.** An extendable simulator to test the performance of data placement and retrieval algorithms for layer-based container images (e.g., Docker images) in Edge like environment. It simulates the network bandwidths between Edge-servers in addition to their storage capacities. It already contains four placement algorithms and two retrieval algorithms. Examples of synthetic and real-world networks in addition to container image dataset are included. Codebase: 2500 LoC in Python. Publicly available at <https://gitlab.inria.fr/jdarrous/image-placement-edge>

Papers reviews.....

- I reviewed papers in *CCGrid'20, ICPP'19, SmartData'19, HPBDC'19, Cluster'17, CCGrid'17* and *CloudCom'17*.

Education

Academic Qualifications.....

- **Ph.D. in Computer Science: Large-scale Data Management Systems** **Lyon, France**
École Normale Supérieure (ENS) de Lyon 2016 – 2019
- **Master in Computer Science: Parallel and Distributed Systems** **Grenoble, France**
Grenoble-Alpes University 2014 – 2016
- **Bachelor in Computer Science** **Damascus, Syria**
Damascus University 2007 – 2012

Research Internships.....

- **A Programming and Data Model for in-situ Frameworks** **Grenoble, France**
Inria Grenoble Rhône-Alpes research center Feb – Jun 2016
The goal was to design a new programming and data model for in-situ frameworks (e.g., FlowVR) to ease the representation and the expressiveness of complex scientific workflow while reducing the performance overhead. This internship was under the supervision of Bruno RAFFIN.
- **Improving the EASY-Backfilling Scheduler using Machine Learning** **Grenoble, France**
Inria Grenoble Rhône-Alpes research center May – Jul 2015
Improve the EASY-Backfilling scheduler in HPC environment using a machine learning algorithm called *Learning to Rank*. An average improvement of 68% has been achieved in case the job run-time is already known (clairvoyant). My advisors were Denis TRYSTRAM and Eric GAUSSIER.

Notable Projects.....

- **NachOS: Mini Operating System** **Grenoble, France**
Grenoble-Alpes University, one-month Master project (4 students) 2015
Implement IO routines, multithread model, virtual memory, file system, and networking in an instructional Operation System called NachOS. Rating: 16/20
- **Hand Gesture Recognition and Fingers Detection** **Damascus, Syria**
Damascus University, graduation project (3 students) 2012
Detect and recognize the hand, hand gesture and fingers gestures from a Kinect depth sensor. Rating: 95/100.
- **Opinion Mining and Sentiment Analysis** **Damascus, Syria**
Damascus University, four-month project (3 students) 2011
Crawl reviews as free-form text from the web, and then analyse these reviews to extract the positives and negatives opinions about the products and their features. Rating: 94/100.

Professional experience

- **Inria Rennes Bretagne-Atlantique, IMT Nantes, STACK team** **Nantes, France**
Research Engineer Jan 2020 – Jun 2020
Implement dynamic erasure-coding chunk scheduling in Hadoop DFS.
- **Syrian Educational Publisher Co., for E-Publishing and E-learning** **Damascus, Syria**
Software Developer Jan 2013 – Aug 2014
I was a Java developer in small-sized company of 13 developers applying the Scrum agile methodology. Accomplished tasks:
 - Extend the core libraries to cover more of the EPUB3 spec.
 - Implement Unit Testing for the core libraries with code coverage of 70%.
 - Develop 60% of the Android application (Epub3 Viewer).
 - Implement the first prototype of the GWT (Google Web Toolkit) website.
 - Implements synchronization between applications running on different devices.

Technical skills

- Programming languages: Python, Java, and C++.
- Frameworks and tools: Hadoop, Spark, Docker, OpenStack, Ansible, Vagrant, and Git.
- Academic experience in Natural Language Processing, Data Mining and Machine Learning.
- Familiar with mobile (android) and web (front-end and back-end) technologies.
- Critical thinking, creative problem-solving, teamwork spirit, and writing skills.

Honors and Awards

- PERSIVAL-Lab scholarship for academic excellence for the year 2015-2016.
- I was an active member in programming competitions (2009-2014):
 - I represented Damascus University (Faculty of Informatics) in the ACPC programming contest - the regional tier of ICPC - within a team of 3 students, and we got the 8th, 14th, and 11th place consecutively from 2009 to 2011.
 - I coached the teams of Damascus University in the ACPC programming contest 2012 and 2013.
 - I was a judge in the Syrian Collegiate Programming Contest - the national tier of ICPC - in 2012 and 2013.
 - I was a problem setter in many national and local contests.
- The 8th place in the fourth annual *Math Olympiad* contest held by Department of mathematics, Damascus University 2012.
- We won, as a team of three, the 3rd place in *Fikra Competition* for our "Simple Geometry Solver" project, Damascus 2011.

Languages

- Professional proficiency in French and English.
- Native Arabic speaker.