MAXIMILIAN – JOEL SCHLEICH

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EDUCATION

University of Oxford **Oxford, United Kingdom**

DPhil (PhD) candidate in Computer Science, Oct. 2015 - 2019 (projected completion date)

- Research Focus: My research is at the interface of database systems and machine learning. I am investigating machine learning algorithms over large-scale databases where my focus is on exploiting the structure of the machine learning input to avoid redundancy in data representation and computation.

University of Oxford **Oxford, United Kingdom**

Master of Science degree (Distinction) in Computer Science, Oct. 2014 – Sept. 2015.

- Master Thesis: Learning Regression Models over Factorized Joins (Grade: 94%)
- Courses: Machine Learning, Databases, Database Systems Implementation, Object Oriented Programming, Computational Learning Theory, Visual Analytics, Computer Security (Average: 84%, Requirement for Distinction: 70%)

The American University of Paris **Paris, France**

Bachelor of Arts degree (Honors) in International Economics and Bachelor of Science (Honors) degree in Computational Mathematics, Jan. 2011 – Dec. 2013, summa cum laude (GPA: 3.9/4)

- Final Thesis: Population Decline and Family Policy in the OECD: A Panel Data Analysis with Application to Germany

PUBLICATIONS

AC/DC: In-Database Learning Thunderstruck.

Mahmoud Abo Khamis, Hung Ngo, XuanLong Nguyen, Dan Olteanu, and Maximilian Schleich. ACM SIGMOD DEEM Workshop, 2018.

- Presents a system called AC/DC which learns regression models and factorization machines over a training dataset that is defined by a join query. AC/DC uniformly captures continuous and categorical features, benefits from factorized computation, and exploits functional dependencies in the underlying data. The experimental results on a real dataset show that AC/DC learns regression models and factorization machines with up to 154K features orders of magnitudes faster than TensorFlow, R, MADlib or libFM.

In-Database Learning with Sparse Tensors.

Mahmoud Abo Khamis, Hung Ngo, XuanLong Nguyen, Dan Olteanu, and Maximilian Schleich. ACM PODS, 2018.

- Presents a unifying in-database analytics solution for a host of optimization problems. Outlines an efficient in-database factorized learning framework for models with continuous and categorical variables, and exploits functional dependencies in the underlying data to decrease the dimensionality of the problem.

In-Database Factorized Learning.

Hung Ngo, XuanLong Nguyen, Dan Olteanu, and Maximilian Schleich. Alberto Mendelzon Workshop 2017.

- Short paper that overviews theoretical results on in-database analytics and its connections to recent works from the database-theory community.

Factorized Databases.
Dan Olteanu and Maximilian Schleich. SIGMOD Record, 45(2), 2016

- Overview of factorized databases and their applications to factorized aggregate computation and factorized learning of regression models. Extends F to general polynomial regression and provides an improved SQL encoding, which can be used to compute the factorized aggregates to learn regression models directly in any standard DBMS.

F: Regression Models over Factorized Views
Dan Olteanu and Maximilian Schleich. VLDB 9(13), 2016.

- Demonstrating how F can be applied over factorized SPJA aggregate views of the input data and its benefits for exploring the feature space to find the best prediction model.

Learning Linear Regression Models over Factorized Joins.
Maximilian Schleich, Dan Olteanu, and Radu Ciucanu. ACM SIGMOD, 2016.

- I built a linear regression learner over database joins called F in C++ and benchmarked against R, Python StatsModels, and MADlib. Experiments with synthetic datasets and a real datasets from a large US retailer show that F outperforms its competitors by several orders of magnitude, while maintaining the same accuracy.
- F's underlying algorithm is worst-case optimal for learning linear regression models over joins, where the data representation for the join result is that of factorized relations with caching. This is unboundedly better than learning over standard relational joins. The parameter governing the time complexity is the fractional hypertree width, which is central to tractability of a wide range of problems, such as: inference in probabilistic graphical models, evaluation for SQL and quantified queries, constraint satisfaction, matrix chain multiplication, and logic.

PROFESSIONAL EXPERIENCE

Global eProcure Limited (GEP) **London, United Kingdom**
Associate Consultant, Feb. - Aug. 2014

- Extensive collection and analysis of client spend data to identify saving opportunities.
- Produce reports and presentations for clients and conduct market research.
- Identify saving opportunities, through tactical and eSourcing processes.
- Support procurement managers running competitive tenders.

Grameen Bank & Grameen Shakti **Dhaka, Bangladesh**
Intern, Jul.-Aug. 2012

- First hand experience with microcredit loans and constructing social businesses.
- Empirical data analysis of Grameen Shakti as a social business.

Coca-Cola Erfrischungsgetränke AG **Ratingen, Germany**
Intern, Product and Promotion Management, Oct.-Dec. 2010

- Contributed to planning meetings and creating marketing strategies with Product and Promotion teams and followed up with distributors to implement decisions.

AWARDS AND PRESENTATIONS

Awards:

- Recipient: SIGMOD travel grant to attend SIGMOD in San Francisco in June 2016.
- Winner: The Hoare Prize for the best MSc Project in Computer Science at Oxford 2015
- Honorable Mention: International Student Awards for Outstanding Master Thesis from the Vienna Centre of Logic and Algorithms (VCLA), March 2016
- Winner: Outstanding Performance and Outstanding Service and in the Economics Department at AUP

Presentations:

- Learning Linear Regression Models over Factorized Joins: Presented at the Information Systems Seminar, University of Oxford (December 2015) and VCLA (April 2016)

TEACHING EXPERIENCE

University of Oxford:

Class Tutor for Database System Implementation, Spring 2016 and Spring 2017.

- Marking and teaching ca. 30 students for weekly homework exercises.

Tutorial Demonstrator for Computer Security, Fall 2015.

- Assisting 30+ students with their cryptography lab exercises.

The American University of Paris:

Student Tutor for Microeconomics, Macroeconomics, Econometrics, Calculus, and Statistics, Sept. 2011 - Dec. 2013.

LANGUAGES

English and German: fluent. French: strong knowledge.

ACTIVITIES

- Captain of the Kellogg College Football Team, Oct. 2016 - June. 2018
- Sports Representative in the Kellogg College Middle Common Room (Student Governing Body), Oct. 2016 - June. 2017
- Founder and Captain of the AUP University Soccer Team, Sept. 2011 - Sept. 2013.
- Economics Department Representative in the Student Senate, Jan. 2012 - Dec. 2013.
  - Liaison between professors and students by attending departmental and senate meetings and organizing events for the student body.
- Member of the AUP Clubs and Sports Committees, Responsible for organizing university wide events. Jan. 2012 - Sept. 2013.
- Content Editor for The Lutetian, AUP's academic journal.