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Teaching Career Goals

I am grateful to my true teachers, the ones that citing a quote from Nikos Kazantzakis[1] *"used themselves as bridges, invited us to cross over it, facilitated our crossing, and then encouraged us to create our own".* This model of an effective teacher, along with a sense of service and my zest for lifelong learning and transferring knowledge to others have attracted my interest in pursuing a career in academia. Over the last few years, I have had the opportunity to teach in several different capacities:

- as a *professional faculty* (1 year) at the **University of California, Berkeley, United States**
- as a *sessional instructor* (5 years) at the **University of Toronto, Canada**
- as a *teaching assistant* (7 years) at the **University of Toronto, Canada** and **University of Crete, Greece**

The courses that I teach span a number of fundamental subjects of the graduate and undergraduate curriculum of Computer Science and Engineering including graduate courses in data storage and retrieval, as well as, introductory courses in programming, systems programming, programming on the web, databases and data management. As a result, I have acquired extensive teaching experience in developing courses and educational materials, as well as, in mentoring and interacting with students.

Besides my genuine passion for teaching, I am always looking for opportunities to improve my own teaching practices and educational skills. Thereby, I have enrolled and completed the THE500 (Teaching in Higher Education) program of the University of Toronto that aims to prepare senior PhDs and post-doc fellows for academic careers. The THE500 was a great experience that have improved my teaching practices by making me more knowledgeable about the ways in which students learn and about different teaching theories and styles.

Computer Science and Data Science is one of the most dynamic and exciting disciplines to study as it offers challenging and significant curriculum, mainly due to the breadth of educational opportunities and the potential to have an impact on real-world problems. Therefore, *teaching in this discipline* means teaching the next generation of technology and innovation professionals, entrepreneurs and researchers. With the advent of technology, teaching in higher education can be an even more exciting and rewarding experience. E-learning technologies, as well as, distance learning technologies, such as the recent development of Massive Open Online Courses (MOOC) offer many opportunities and challenges. These are even more stressed in teaching in the field of Computing Science where students are highly creative, have broad interests and look for ways to apply their knowledge to many other fields, such as the physical and biological sciences, health, finance, the humanities and fine arts, among many others. This calls for an interdisciplinary approach of teaching in computing disciplines, with frequent references to real-life problems and examples, as well as, sophisticated design of projects and assignments that can have an impact in people's everyday lives - characteristics that I consistently try to instill in my teaching practices.

I am confident that my longtime involvement in teaching and research activities, along with my exposition in an industrial environment, either as a researcher or an innovator, can provide for a teaching context that is effective and interesting for the students and can complement the teaching capacity of your academic institution. At the undergraduate level, I am well-suited to teach courses spanning a large range of the Computer Science curriculum;

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[1] Modern Greek writer & philosopher

from introductory courses on programming and software engineering to system programming or programming on the web, and to introductory or advanced courses on databases as depicted in my teaching experience. In the future, I would be interested in organizing and teaching an undergraduate or cross-listed course on *web search and data mining* bringing some of my experiences as a researcher into the class and transferring knowledge to students that they will find valuable in their careers. At the graduate level, I am well-suited to teach courses related to data storage and retrieval. I would also enjoy organizing and teaching a *seminar on advanced topics in data mining* with special focus on online social networks.

Transferring knowledge to others and experiencing the joy of making a clear difference in the lives of students, as they gain new insights and become more interested and knowledgeable in a subject is very rewarding. In addition, enjoying a high level of interpersonal interaction with students and other teaching professionals, being a lifelong learner by incorporating new research findings, technologies and science events into the classroom are aspects of life that I would like to pursue and enjoy in my career. I believe that teaching in higher education in the field of Computer Science provides the potential to help me achieve these. My long-term career goal is to join a renowned academic institution with world-class faculty, excellent resources, industrial partnerships and outstanding student body that can help me grow as an educator. I am looking forward to an academic environment that welcomes creativity, fosters the interchange of ideas and academic conversations, and encourages collaboration.

Teaching Philosophy

Knowing your Students and Fulfilling their Learning Objectives & Career Goals

Each year, large numbers of students are attracted to departments of Computer Science, Computer Engineering and related disciplines with the confidence that they will pursue an interesting and innovative curriculum due to the breadth of educational opportunities, along with the reasonable prospect of following an interesting high-quality career. In fact, these are examples of the most dynamic and exciting disciplines to study, where one can have an impact on real-world problems. Therefore, teaching in this discipline means teaching the next generation of technology and innovation professionals, entrepreneurs and researchers.

Computer Science students expose specific characteristics-they are highly creative, enjoy solving problems and being mentally challenged, like to take initiative, design and build things, are genuinely curious and tech-savvy, know how to search and combine information - which provide for opportunities and challenges for the educator. As a result, they usually have broad interests and look for ways to apply their knowledge to many other fields, such as the physical and biological sciences, health, finance, the humanities and fine arts, among many others. This calls for an *interdisciplinary approach* of teaching in computing disciplines, with frequent references to real-life problems and examples and sophisticated design of projects and assignments that can have an impact in people's everyday lives. (This is reflected in a number of projects that I have designed in the courses I have taught; for details please see details in the teaching experience section.)

Moreover, there are diverse educational objectives that students in computing have. They have to be prepared for pursuing post-graduate education, or pursuing successful technical careers or even to become leaders in their field of expertise. As a result, teaching in computing is related not only to the need of students to obtain *technical skills*, but also *soft skills*. The former is related to their ability to apply knowledge of mathematics, science and engineering in order to identify, formulate, and solve problems or design systems and processes that conform to given cost constraints and specifications. The latter is related to their ability to work cooperatively, respectfully, creatively, and responsibly as members of a team, understand the norms of expected behavior in computing practice and the underlying ethical foundations and communicate effectively by oral, written, and graphical means. It also requires an awareness of global and societal concerns and their importance in developing engineering

solutions. (This teaching approach is reflected in a number of projects that I have designed in the courses I have taught; for details please see details in the teaching experience section.)

My Teaching Context as a Reflection of a Teacher, Researcher & Innovator

My teaching context and ability of transferring knowledge is principally based on three dimensions of my profile; my experience assuming roles of a *teacher*, *researcher* and *innovator*.

My experience as a Teacher

As a higher education teacher, I try to display evidence of effective course planning and student-teacher relationships, to demonstrate sufficient mastery of the subject area, to make effective use of a variety of available materials and provide for student participation. I regularly use purposeful and thought-provoking questions and provide interesting and adequate reinforcement and motivation. My directions to students are clearly thought out and well stated and class material is well organized and timely available online, while student assignments are carefully designed and planned. Furthermore, I try to maintain student interest and attention and work constructively with individual or group. In my interaction with students I use positive statements and try to maintain a friendly but respectful teacher-student relationship. (This approach is reflected in a number of student comments that I include in Appendix I and Appendix II.)

As an effective teacher, I try to provide the larger perspective of the course material to students, usually bringing examples from the real-world and trying to make them aware with *real-world challenges*, *practices* and *experiences*. More importantly, I understand that a course is an integral part of a student's overall learning experience in a university program. As such, an instructor's interest and goal should be to try to *fill the gap between different curriculum courses* by extending students' existing knowledge and by preparing them for the courses to follow in their program. This requires coordination with other instructors and mutual understanding of a student's needs.

My experience as a Researcher

As an experienced researcher, I try to take advantage of my expertise in enhancing the understanding of students on a number of computing concepts. Regularly, I make references to open research problems and challenges, as well as, how different research approaches, to solve a problem, have resulted in the tools that have become popular today. This provides for a learning environment that goes beyond sterile knowledge into including decision making processes, as well as, challenges and breakthroughs, and in the end offers a better understanding of the material which turns students to, not only effective users, but also real experts of their discipline.

Moreover, my research interests span a broad range of interesting topics including *databases*, *data mining*, *graph and information network mining*, *social information networks*, *big data*, *smart cities* and *urban informatics*, *computational social science* and *recommender systems*. These are *hot topics* that make it easier to design interesting courses and projects that can attract and engage many students. And, as these topics require an interdisciplinary approach with questions and ideas coming from both social and computing sciences, they can be of interest to students in other disciplines. My publication record, the citations to my publications, as well as, previous work experience reflect on these interests (please see Curriculum Vitae and Research Statement).

My experience as an Innovator

In parallel to my experience as a teacher and researcher, I have had the opportunity to obtain valuable industrial experience in several different capacities: twice, as a research intern, in a world-renowned research lab, such as Yahoo! Research, as a patent innovator applying for two technological patents (patent application status obtained), and as a software architect and innovator of a world-class conference management system. My experience in Yahoo! Research was tremendous, as it was providing of an environment that requires *thinking big* of both problems and engineering solutions that can have impact in the lives of millions of users. This provided with

invaluable experience that I consider important to my teaching career, as it is easier to realize the potential of students when you are exposed to the real computing problems of our world. It also helps the build a syllabus that is rigorous and in alignment with global problems and approaches and make the right references when needed.

Besides my interest in deploying quality research, I am very fascinated in building large-scale information systems. Among others, such as a Movie Recommendation System dedicated to research purposes and an Online Questionnaire System, I would like to especially refer to *Confious*[2], a state-of-the-art conference management system that combines modern design, sophisticated algorithms and powerful engine, so as to efficiently and professionally support the submission and reviewing process of an academic/research conference or workshop. It is important to note that my involvement with Confious provided for hands-on experience on the whole *business development process*; from design, development and maintenance of the service to sales and customer support, experience that I would like to share with the prospective entrepreneurs and innovators of our student body.

Overall, I am confident that my experience as a *teacher*, *researcher* and *innovator* reflects a unique teaching context and capacity that positions me well for pursuing a career in teaching in the discipline of Computer Science.

Encouraging Social Learning

Reading course material from textbooks, working on assignments and projects, looking for extra information in other available resources, either offline or online, are essential and valuable aspects of the learning process. However, all these are further enhancing one's expertise and understanding of a subject when applied within a *social context*. I regularly recall my years as an undergraduate student and I come to realize the importance of spending, along with classmates, long hours in our computer labs (at that time Google was a fresh startup and dialup internet connections were not widely available outside a university network). There are a large number of social interactions that take place when you physically share a working or reading environment with colleagues or classmates. Sharing information, trying to prove yourself or each other wrong (or right), challenging ourselves or being exposed to fallacies and pitfalls were all aspects of a *social learning process* where we were seeking acceptance from our social group and we were learning through influential models. It is my strong belief that being exposed and engaging in such social interactions, on a daily basis, for a number of years, was critical to our deep understanding of computer science concepts and is describing a learning environment that is rather impossible to bring or reproduce in a lecture class or when one is working at home.

Motivated by my own experience of social learning processes that were in effect in our computer labs, I always try to convince my students to share knowledge (not solutions) with their colleagues and classmates, engage in fruitful discussions, share ideas and collaborate (as needed), work together to understand concepts/assignments and constantly challenge their knowledge by asking the right questions to themselves and their classmates. In fact, I am silently but consistently inviting those students to adhere to social learning practices that I'm sure will position them better in any working environment in the future to come.

Instilling a Supportive Culture that Brings out the Best in Students

Despite the large size of undergraduate classes and diversity of student body, it is important to maintain or put forward a supportive learning culture to the students in a positive and assertive way that presumes success. This effort implies interacting with students at a level of mutual trust, many times beyond class or regular office hours. My goal as an instructor is to develop each student's capacity for original and incisive thinking, as well as, their understanding of fundamental concepts, so that they will be better positioned to solve the computing and engineering problems of the years to come. (This is reflected in a number of student comments that I include in the Appendices.)

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[2]http://www.confious.com

Teaching Experience

This section provides a high-level overview of my *teaching experiences*, *evidence of teaching excellence*, as well as, *a summary of my course evaluations*.

Overview of Teaching Experience

I have had the opportunity to teach in several different capacities: as a professional faculty at the Masters in Data Science (MIDS) of the University of California, Berkeley's School of Information (2 times; 4 more scheduled), as a sessional instructor (12 times), head teaching assistant (2 times), and teaching assistant (20 times) at the departments of *Computer Science*, *Computer and Mathematical Science*, *Electrical & Computer Engineering* and *Mechanical and Industrial Engineering* of the University of Toronto, Canada. In the past, I also served as a teaching assistant (4 times) at the department of *Computer Science* of the University of Crete, Greece. The courses that I taught were spanning many fundamental subjects of the graduate and undergraduate curriculum including introductory courses in programming, systems programming, programming on the web, databases and (big) data management. As a result, I have acquired extensive teaching experience in developing courses and educational materials, as well as, in mentoring and interacting with students. This section provides a high-level overview of my teaching experiences grouped by role and by university department.

Professional Faculty (2015 - present) at University of California, Berkeley, United States

I have obtained extensive experience working as a professional faculty at the University of California, Berkeley's School of Information and in particular at the Master of Information and Data Science (MIDS) program delivered online (2 appointments, and another 4 scheduled). In particular:

- School of Information, University of California, Berkeley
  - Data Science W205 – Storing and Retrieving Data (Fall 2015, scheduled Winter 2016, Spring 2016)

Sessional Instructor Experience (2010 - 2015)

I have obtained extensive experience working as a Sessional Instructor at the University of Toronto (more than 10 appointments) in various courses of the Computer Science curriculum. In particular:

- Computer Science Department, University of Toronto
  - CSC343-Introduction to Databases (Winter 2015, Fall 2014, Winter 2014, Fall 2013, Fall 2012, Fall 2011)
  - CSC309-Programming on the Web (Winter 2015, Summer 2012, Summer 2011)
  - CSC209-Software Tools and Systems Programming (Summer 2013)
- Electrical and Computer Engineering Department, University of Toronto
  - APS105-Computer Fundamentals (Fall 2010)
- Mechanical and Industrial Engineering Department, University of Toronto
  - APS106-Fundamentals of Computer Programming (Winter 2013)
- Computer and Mathematical Sciences Department, University of Toronto, Scarborough
  - CSCC43-Introduction to Databases (Winter 2015)
  - CSCB09-Software Tools and Systems Programming (Winter 2012)

As an instructor I was responsible for all aspects of delivering the course, including: planning the lectures, tutorials, assignments and tests, and marking schemes; maintaining a course website, delivering the lectures; providing appropriate contact time outside of class to students, through office hours, email, the course website and/or the course bulletin board; writing the TA contract(s) for the course and supervising the TAs; managing the grading for the course; doing any grading not handled by TAs; invigilating the final exam; managing the grades and submitting final course grades; coordinating with the other instructor(s) to maintain consistency (when there were more than one instructors of a course.)

Teaching Assistant Experience (2003 - 2010)

I have obtained extensive experience working as a (Head) Teaching Assistant at the University of Toronto (more than 20 times) and at the University of Crete, Greece (4 times) in various courses of the Computer Science curriculum. In particular:

- Computer Science Department, University of Toronto
    - CSC443-Databases System Technology(1 time)
    - CSC343-Introduction to Databases (3 times + 2 times as a Head TA)
    - CSC309-Programming on the Web (6 times)
    - CSC340-Information Systems Analysis & Design (1 time)
    - CSC209-Software Tools and Systems Programming (1 time)
    - CSC104 - The Why and How of Computing (1 time)
- Computer and Mathematical Sciences Department, University of Toronto, Scarborough
    - CSCD08-Software Engineering (2 times)
    - CSCB09-Software Tools and Systems Programming (4 times)
    - CSCA20-Computer Science for the Sciences (1 time)
- Computer Science Department, University of Crete, Greece
    - CS460-Data Base Management Systems (2 times)
    - CS565-Business Process and Workflow Management Systems (1 time)
    - CS359-Web Programming (1 time)

As a teaching assistant my responsibilities mainly included organizing reference materials, visual aids and other materials as required by university professors; conducting seminars, discussion groups and laboratory sessions to supplement lectures; assisting in preparation and administration of examinations; graduating examinations, term papers and laboratory reports.

Summary of Course Evaluations

I include below a summary of my course evaluations in a chronological order of appointment. These scores are averaged over all the times that I taught the same course. Moreover, as the rating system is different among different departments or it has gone under revision the last years, I provide a normalized score (out of 100%) for comparison purposes. Detailed course evaluations can be provided upon request.

Course Evaluations Table

Academic Institution	Course Code	Semester	Total Student Enrolment	Normalized Score (100%)
University of Toronto	APS105/APS106	F10, W13	215	82.5%
University of Toronto	CSC309	S11, S12	121	67.5%
University of Toronto	CSC343/CSCC43	F11, F12, F13, W14, F14, W15	1022	77%
University of Toronto	CSC209/CSCB09	W12, S13	139	78%
University of California, Berkeley	Data Science W205	F15	30	Pending