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Title: "Multifaceted Engagement of BSc Students in Computer Science Research"

Date: December 15, 2015
Time: 09:00 - 09:45
Place: Room 105, Social Facilities Centre, University Campus

Abstract:
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Research entails a deep systematic investigation of sources in order to reach new, previously unknown conclusions. In Computer Science, these conclusions are often in the form of algorithmic developments or in the form of software artifacts tackling unconventional, real-life challenges. In both cases, the conclusions have to be publishable at high caliber journals, conferences or competitions, such that the credibility of the developments is externalized and recognized by the wider research community.

While the above type of research is a fundamental attribute of postgraduate studies, undergraduate students are often not part of this process for a variety of reasons, including: i) lack of advanced domain knowledge (usually taught at the post-graduate level); ii) lack of mathematical or laboratory skills (e.g., proving a theorem or managing a complex software stack); and iii) lack of writing and presentation skills (i.e., the dissertation is written at the end of their studies).

During the last decade, I have applied a wide range of empirical methods to engage undergraduate students in research as soon as they are admitted to the University. Particularly, students have been encouraged through a variety of methods to familiarize themselves with research through our courses and become active contributors to our quest for academic excellence. The applied methods have had some very promising results, particularly: i) several summer research internships since 2012 (for 1st year BSc students); ii) several research interviews available on Youtube since 2014 (for 2nd year BSc students); iii) 5 distinctions in the Intl. ACM SIGMOD programming competition since 2010 (for 3rd year BSc students); iv) 21 journal and conference proceedings since 2007 (for 4th year BSc students); and v) 3 international awards for innovative research systems since 2007 (again for 3rd and 4th year students).

In the scope of my case study, I will detail the applied methodology for each different type of activity and also summarize the lessons learnt. I claim that the provided achievements have helped our undergraduate students to reach their personal goals and our Data Management Systems Laboratory (DMSL) to meet its research agenda. Particularly, the above engagement allowed 6 students to obtain fellowships for graduate studies (e.g., Fulbright, Oxford), 5 students to advance to PhD programs, while all of them have moved on with MSc studies in the US, UK, Canada and Switzerland.

A. Awards (with participation of 4th Year BSc Students)
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Note: Timotheos Constambeys has carried out his B.Sc. thesis under my supervision.


Note: This award stems from the EPL371 - Systems Programming course project that Georgios Constantinou, Marios Constantinides, Silouanos Nicolaou have implemented in 2011.


Note: Marios Papas has been a B.Sc. research advisee. He is now a Postdoc at Disney Research Zurich, Switzerland.

B. Publications (with participation of 4th Year BSc Students)
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Note: Kyriakos Georgiou has carried out his B.Sc. thesis under my supervision. He is now an MSc student at the University of Toronto, Canada.


Note: Paschalis Mpeis has been my B.Sc. thesis advisee. He is now a PhD student at the Univ. of Edinburgh, UK.


Note: Giannis Evagorou has carried out his B.Sc. thesis under my supervision. He is now a PhD student at Imperial College London, UK.

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with IEEE MDM '15" (Mobisocial '15), Vol. 2, pp. 98-103, Pittsburgh, PA, USA, 2015.

Note: Chrysovalantis Anastasiou has carried out his B.Sc. thesis under my supervision. He is now an MSc Fulbright fellow at the University of Southern California, USA.


Note: Marios Mintzis has carried out his B.Sc. thesis under my supervision. He is now an MSc student at the University College London, UK.


Note: Lambros Petrou and Timotheos Constambeys have carried out their B.Sc. thesis under my supervision. Petrou has been an Oxford Fellow at Oxford University, UK.


Note: Lambros Petrou has carried out his B.Sc. thesis under my supervision. He has been an Oxford Fellow at Oxford University, UK.


Note: Marios Mintzis has carried out his B.Sc. thesis under my supervision. He is now an MSc student at UCL, UK.


Note: Constantinos Costa has carried out his B.Sc. thesis under my supervision. He is now a PhD student at the Univ. of Cyprus, Cyprus.

[C46] "CLODA: A Crowdsourced Linked Open Data Architecture", Georgios Larkou,
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Julia Metochi, Georgios Chatzimilioudis and Demetrios Zeinalipour-Yazti

Note: Julia Metochi has carried out her B.Sc. thesis under my supervision.


Note: Andreas Pamboris has been a B.Sc. research advisee. He got his PhD from Imperial, UK and his MSc from UCSD, USA.


Note: Georgios Constantinou, Marios Constantinides, Silouanos Nicolaou were students of the EPL371 - Systems Programming course I taught in 2011.


Note: Christos Aplitsiotis has carried out his B.Sc. thesis under my supervision.


Note: Silouanos Nicolaou has carried out his B.Sc. thesis under my supervision.


Note: Georgios Constantinou, Marios Constantinides, Silouanos Nicolaou were
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students of the EPL371 - Systems Programming course I taught in 2011.


Note: Georgios Constantinou, Marios Constantinides, Silouanos Nicolaou were students of the EPL371 - Systems Programming course I taught in 2011.


Note: Constantinos Costa has carried out his B.Sc. thesis under my supervision.


Note: Orestis Spanos has been a B.Sc. research advisee.


Note: Martha Vasiliadou has been a B.Sc. research advisee.


Note: Andreas Pamboris has been a B.Sc. research advisee.

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Note: Marios Papa has been a B.Sc. research advisee. He is now a postdoc at Disney Research Zurich, Switzerland.

C. Programming Competitions (3rd & 4th Year BSc Students)
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Since 2010, I have yearly advised undergraduate students to participate in the ACM SIGMOD (Special Interest Group on Management Of Data) Programming Contest, the premier data management competition organized by MIT, USA. Particularly, interested students were asked to participate in the given competition in place of an assignment given to the rest class. The given competition allows students to practically combine the taught material of my undergraduate courses EPL371 (Systems Programming) and 446 (Advanced Databases). In this way, undergraduate students had the opportunity to dig into complex algorithmic and system challenges that arise in modern data management systems. The given experience has been very rewarding for students. For example, Chrysovalantis Anastasiou (BSc graduate of 2014 class, now a Fulbright Fellow at Univ. of Southern California, USA) mentioned:

"After a few weeks of hard work, my teammate and I ranked 13th worldwide. It was one of my best experiences during University, since we had to combine all the knowledge gained in order to build a high-throughput system. Our accomplishment was a sign that we could excel in the area of databases and high-performance systems."

Rankings:
- 2010 (9th Position)
  
  Note: Fotos Fragkoudis (PhD student at USC, USA), Andriani Stylianou (MSc student at EPFL, Switzerland), Onisiforos Onisiforou.

- 2011 (6th Position)
  
  Note: George Constantinou (PhD student at USC, USA) and Marios Constantinides (PhD student at UCL, UK) and Silouanos Nicolaou.

- 2013 (10th),
- 2014 (9th),
- 2015 (5th - finalist!)
  
  Note: Lambros Petrou (MSc student at Oxford, UK), Marios Mitzis (PhD student at UCL, UK), George Koummetou.

D. Interviews (2nd Year BSc Students)
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Since 2014, 2nd year undergraduate students are asked to carry out an interview of some faculty member and present their video to the rest class. I have provided numerous such interviews to students with encouraging results, e.g.,

https://www.youtube.com/watch?v=-A47oc604QQ
E. Student Internships (1st Year BSc Students)

During my EPL132 - Programming Principles II course, I carry out a yearly contest (see http://www2.cs.ucy.ac.cy/~dzeina/courses/epl132/project-2015.html). Winners of the contest are given the opportunity to carry out a summer research internship at the Data Management Systems Laboratory I am directing. In the past, students have worked on research projects that became open source, e.g.,

https://github.com/dmsl/imu-win8

F. Progress of Students

Fellowship Awardees

1) Chrysovalantis Anastasiou (Fulbright Fellow at Univ. of Southern California, USA).
2) George Constantinou (Fulbright Fellow at Univ. of Southern California, USA).
3) Lambros Petrou (Oxford Fellow at Oxford, UK - turned down Fulbright Fellowship at Univ. of Southern California, USA).
4) Fotos Fragkoudis (Univ. of Southern California, USA).
5) Marios Papa (Fulbright Fellow at Univ. of California - San Diego, USA)
6) Andreas Pamboris (Fulbright Fellow at Univ. of California - San Diego, USA)

PhD Students

1) Giannis Evagorou (Imperial, UK)
2) Paschalis Mpeis (Univ. of Edinburgh, UK)
3) Marios Mintzis (UCL, UK)
4) Marios Constantinides (UCL, UK)
5) Constantinos Costa (UCY, Cyprus)