Teaching Performance Modeling in the Era of *140characters Information*

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ABSTRACT

It is not easy to state the birthdate of Performance Modeling (PM). On April 1971, a workshop on System Performance Evaluation was held at Harvard University. Richard Muntz was the chairman of the session "Queueing Theoretic Models". In that session, Jeffrey Buzen presented "Analysis of system bottlenecks using a queueing network model". In the 70s, some groups were founded to work on the computer performance modeling. The National Bureau of Standards organized several task groups and the Computer Performance Evaluation Users Group collected people "from many United States Governmental agencies involved in various phases of this field … a number of academicians as well as analysts from business and industry working in this area, and this gave rise to the formation within the ACM of SIGME [Special Interest Group in Measurement and Evaluation] which is currently known as SIGMETRICS." In 1973 the International Federation for Information Processing founded the Working Group 7.3 Computer System Modelling and its International Symposium on Computer Performance Modeling, Measurement, and Evaluation started to take place. More difficult is to go back to the first courses in general Performance modeling and prediction. Definitely, in the 80s the PM area reached its peak and relative courses were taught in some universities for some decades. In the first years of 2000, some of these general PM courses started to disappear while specific contents still remained in courses relative to applications as "tools" for that particular area. A question naturally arises: is it no more time to teach the modelling principles and basic methodologies? Is it time to just use the techniques in specific domains? The author has not sure answers, but some doubts. Starting from a close examination of the state of the art of PM courses in the main Universities, we try to give some food for thought about the role of the education, the meaning of knowledge and information, their difference and the importance of criticism to face with incoming changing challenges.

Keywords

Performance Evaluation; Modeling Techniques; Education; Knowledge.

ICPE '17 Companion, April 22-26, 2017, L'Aquila, Italy
ACM 978-1-4503-4899-7/17/04.
http://dx.doi.org/10.1145/3053600.3053641

1. INTRODUCTION

The roots of *Performance Modeling* were planted in the 70's.

In June 1959, the first International Conference on Information Processing was held in Paris, under the sponsorship of UNESCO. During that conference, the International Federation for Information Processing (IFIP) was established to meet the need to promote information science and technology, stimulating research, development and cooperation among several countries. Among the others, one important aim was "encouraging education in information processing" [2]. In 1972, the Technical Committee TC 7 System Modeling and Optimization was established and it started three working groups among which the WG 7.3 Computer System Modeling. In 1973, the WG 7.3 - International Symposium on Computer Performance Modeling, Measurement, and Evaluation started to take place.

In the USA, the National Bureau of Standards and its Institute for Computer Sciences and Technology started a series of Federal Information Processing Standards (FIPS) Task Groups. In 1971, the FIPS Task Group 10 – Computer Component and Systems Performance Evaluation promoted "a self-governing Computer Performance Evaluation User's Group (CPUEG) whose purpose is to disseminate improved techniques in performance evaluation through liaison among vendors and Federal ADPE users, to provide a forum for performance evaluation experiences and proposed applications, and to encourage improvements and standardization in the tools and techniques of computer performance evaluation." [1]. The CPUEG collected people "from many United States Governmental agencies involved in various phases of this field … a number of academicians as well as analysts from business and industry working in this area, and this gave rise to the formation within the ACM of SIGME [Special Interest Group in Measurement and Evaluation] which is currently known as SIGMETRICS". In 1974, for the first time the proceedings of 8th meeting of CPUEG was made available as "a major source in the limited literature on computer performance, evaluation and measurement". It is quite interesting what they stated in the preface: "Computer performance, evaluation and measurement is now vital to the designer, the user and the management-owner of a modern computer system.

To some, computer performance, evaluation and measurement is a tool, a marriage of abstract thought and logic combined with the techniques of statistical and quantitative methods. To others, it is a technique with very heavy reliance on modeling and simulation and simultaneously involves features of both classical experimentation and formal analysis. The problem of exact specification is made the more difficult by the recent birth and development of computer performance, evaluation and measurement as a discipline within computer science".

In ten years the most Universities activated Performance Modeling (PM) courses and they have been active for at least 30 years.

From that starting time a long path has been followed, Computer Systems have deeply changed. The technological advances have made possible concepts and systems that were surely unimaginable at that time. Nevertheless, "the problem of exact specification" is again here and it poses urgent questions.

In this talk, we try to make the point about the healthiness of PM teaching.

In the 80s the PM area reached its peak and relative courses were taught in most universities for some decades. We start from a hopefully up-to-date "map" of the current PM courses around the world. It is easy to identify a core common agenda of these courses. Without fear of contradiction, we can say that the PM teaching plays a leading role in the critical ability development. The modelling process is a good training. Nevertheless, since the early 2000's, some of these general PM courses started to disappear while specific contents still remained in courses related to applications as "tools" for that particular area. A question naturally arises: is it no more time to teach the modelling principles and basic methodologies? Is it time to just use the techniques in specific domains? This is a quite general question that span far beyond the PM area.

We are invaded from an excess of specialization and its negative effect starts to be recognized. The critical thinking and ability to face with incoming changing challenges are the real skill that a high degree instruction should have among its aims. Does the University want to recuperate the thinking spaces? Or do we want to completely abdicate to the economic/technique domain?

Starting from the current map of the general courses and the evolution of some of them into specific applications, we seek answers and possibly a new agenda for a general PM teaching.

REFERENCES

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BIO

Vittoria De Nitto Personè is Associate Professor in Computer Engineering at the University of Rome Tor Vergata. In 1984, she received the Laurea degree in Computer Science summa cum laude from the University of Pisa, Italy.
Her research activity lies in the field of modeling and performance evaluation of computer/communication systems. The methodologies includes, extended queueing networks, markovian processes, analytical methods and simulation. Main applications include finite capacity and blocking systems, parallel systems, wireless systems and networks, web systems, cloud systems, scheduling and admission control. She has published monographies and papers in international journals, books and conferences. Over 25 years of experience in Performance Modeling teaching and in motherhood nurtured her strong love for Education.