KNOW THE PERSON BEHIND THE PAPERS

Paul Spirakis

Bio: *Paul Spirakis was the director of the Greek Computer Technology Institute (CTI) from 1996 to 2016. He is now in the leadership team of the Leverhulme Research Center for new materials design of the University of Liverpool , a faculty member in U. Liverpool and also in U. Patras. He graduated from the National Technical University of Athens and earned his Ph.D. from Harvard University.Among other, Spirakis is known for his contributions in probabilistic techniques in algorithms , foundations of distributed computing and algorithmic game theory. He co-established the present form of the Computer Technology Institute and Press "Diophantus" in Greece. He played an important role in the establishment of several Conferences such as the European Symposium on Algorithms , the Conference on Distributed Computing (DISC) and the Conference on the Internet and Network Economics (WINE). He was the President of EATCS from 2016 to 2020 and he is a Member of Academia Europaea and also the Editor-in-Chief of the TCS-A journal. He served in several research related EU bodies and chaired the ERC Informatics Panel.*

We ask all interviewees to share a photo with us. Can you please tell us a little bit more about the photo you shared?

Paul:

I share two photos. The first is in Boston on 1980 with my advisor John Reif. My wife Asimina is at the right corner (not so visible).The second is me and my youngest student (my grandson Marios) in Liverpool on 2019.This photo shows that I can teach theory to very young students, even in the street, buying food.

Can you please tell us something about you that probably most of the readers of your papers don't know?

Paul: When I started my undergraduate studies in 1973 in Greece (in Electrical Engineering) I had never used a computer. In 1975 I started to interact with a mainframe by punching and submitting cards to a person who was responsible for compiling and delivering the output to us in printed form. The first computer language I used was FORTRAN. In 1977 I started my undergraduate Diploma Thesis

on the subject "Information processing in the nervous system of man". I learned then about neurons and I wanted to do graduate work in biomedical engineering. At the same time I started learning about Markov Processes and I proposed a Markov Chain for the information processing in the cerebellum ! As an Electrical Engineer I was facsinated from the use of stochastic processes.

Is there a paper which influenced you particularly, and which you recommend other community members to read?

Paul: A year after starting my graduate work at Harvard I read the paper of Dana Angluin and Leslie Valiant on Fast Probabilistic Algorithms for Hamiltonian Circuits and Matchings (appeared in 1977 , I read it in 1979). This was the first time I saw the Chernoff bounds. I used them later in my Ph.D. Thesis. At that time almost nobody was using tail bounds on sums of random variables.

Very young I read the book of Karl Marx "Das Kapital". I suggest it to everybody independently of political beliefs.

Is there a paper of your own you like to recommend the readers to study? What is the story behind this paper?

Paul: Read the paper "An Optimization Approach for Approximate Nash Equilibria" (Internet Mathematics 2008) by Haralampos Tsaknakis and myself. Haralampos was a mathematical genius. He is no longer in life and I want to point out this paper so that we all remember him. At that time Haralampos was working in a managerial post in some firm in Greece. I met him first when we were both high-school students in Thessaloniki in 1972. We met again around 2005 and he

was working on some security problems in his spare time. Thn I told him "do you want to work on a nice problem in Game Theory ?" . And this paper (whose achieved approximation ratio is not beaten till now) came out afterwards.

When (or where) is your most productive working time (or place)?

Paul: I am an evening person. I start working in the morning but not very

early. During the day I interact with students , go to meetings, teach and administrate , write some reports etc. My evenings are usually devoted to research , some time until late at night.

The schedule is different when I travel but nowadays this is not a problem.

My favorite work place is my office (and my office at home) but I can think and work almost everywhere (even in train or plane)

What do you do when you get stuck with a research problem? How do you deal with failures?

Paul: Failures are much more frequent than successes. When I am stuck I keep trying and I try to understand the problem better. Also I discuss the problem with colleagues and students. Hard problems need lots of trying. Sometimes I become disappointed and wnat to forget the problem but it comes again in my mind. It helps to work on more than one problem at the same time. When you are tired of one you can switch to the other. My experience is that when I insist on a problem , something comes out eventually , maybe not on the original problem but on a related one.

Is there a nice anecdote from your career you like to share with our readers?

Paul: When I was applying for graduate studies I was mostly applying to the U.S. (Greece had not graduate studies at that time in 1978. And I was mostly applying for biomedical engineering or cybernetics. Then one day I got a phone call from Christos Papadimitriou. He was visiting Harvard and my application to Harvard somehow arrived to him. He told me if I knew a lot about the subjects I was looking for. I honestly told him that I had no idea but I was fascinated by subject names. He told me "here we have some different topics , such as algorithms , automata etc.". I took the risk to accept the offer (was coming with a fellowship and my parents could not pay for graduate studies). I was lucky in my decision then.The funny thing is that in my first year at Harvard I worked on performance evaluation of computer systems (not on algorithms) Was natural , it involved some queuing theory and I knew a bit of that from my undergraduate studies. After a year I switched subject (and advisor !) and I started working on algorithms with John Reif. John influenced me a lot and inspired me to work on those , new for me then , topics. I owe a lot to John for his direction and for helping me to start a career.

Do you have any advice for young researchers? In what should they invest time, what should they avoid?

Paul: They should work on subject that psyche them ! They should avoid current fashion (unless they really want to work on topics related to current fashion). Think deeply , make research your way of life.

What are the most important features you look for when searching for graduate students?

Paul: Mathematical talent and desire to work even on subjects they are not very familiar with.

Do you see a main challenge or opportunity for theoretical computer scientists for the near future?

Paul: Theoretical computer science has a great future. New topics and questions arise all the time : population protocols in distributed computing , economics and algorithms , new models of dynamic and random graphs , theory of learning and big data , new complexity classes , are some examples.

In my career I switched topics several times starting to work on topics that were not so known (or even did not exist) before.

What kind of opportunities should EATCS offer to researchers, and especially to young researchers?

Paul: EATCS is a scientific association. It offers already many opportunities , ranging from prizes and awards to schools and to job openings announcements. Most importantly it supports several theory conferences (including its flagship conference ICALP) and thus offers to researchers (especially to young ones) the opportunity to meet peers and older scientists and gain in wisdom and cooperation. EATCS is a big family of european theorists. The bulletin itself highlights important topics and discoveries. Hard to find out if EATCS misses to offer some opportunities to researchers. If there is any I am sure that the EATCS bodies will spot it and act on it also via continuous interaction with european researchers.

What can be the role of EATCS in solving the challenges of our society?

Paul: Well , it could motivate the relation of such challenges to theory ! For example , I think we need a theory of humane algorithms. When theorists (especially young ones) become aware that their skills and scientific goals can also help society then an additional quite strong team of thinkers will be added to the people that try to solve the challenges of our society.

Please complete the following sentences?

- *My favorite movie is...Matrix (the first one).*
- *Being a researcher...is big pleasure and a way of life.*
- *My first research discovery...was not on theory but on performance analysis of computer systems.*
- *Theoretical computer science in 100 years from now...will be even stronger but perhaps very different from now.*
- *EATCS in 50 years from now...will have many more members and will be be key in relating theory to societal challenges.*
- *Love for research and for teaching ... is key to being a happy academic.*