



Prof. Pierre Kuonen



Research Areas:

- Parallel and distributed systems
- High performance computing
- Programming languages
- DNA analysis

Which changes affect your scientific area in particular and how do you deal with this challenge in terms of operationalizing changes and predict future developments?

The advent of the digital society has had a significant impact on the profession of university professor, both in education and in terms of research. In terms of education, the fact that in a few clicks any student can quickly find all the information necessary for a course on a given topic has profoundly changing the professor-student relationship. Indeed, in the past, the professor was the one who, through his courses, gave access to information about the taught matter (books, handouts and course notes). This is no longer the case today, the professor is no longer the main source of information for the student.

In terms of research, multiplication of documents easily available to researchers on his field of work has exploded. It is now impossible for a researcher to know everything that is done in his domain of work, especially if he works on a hot topic. In addition, the availability of many rankings systems allowing everyone to be easily compared with others, pushes all researchers, especially doctoral students, to publish more and more as well as more quickly. Besides the increase, already mentioned, of available documents, this results in an overall decrease in the quality of these documents, or at least of their information content.

Finally, as the documents are usually available in electronic form, the temptation to use "copy / paste" instead of writing original texts is high. One of the major impacts is that it starts to become necessary for research supervisors to use anti-plagiarism systems to ensure the originality of the work produced in his team.

I have solely indicated above the negative effects of the digital society because they tend to be underestimated. Of course the digital society also have a lot of positive effects but they are much more recognised and advertised.

To cope with these changes few things can be done. In terms of education, the "flipped classroom" can provide an answer. Indeed, if the student does not need the professor to find information on the subject being taught, he still needs the professor to transform this information into "knowledge". Accordingly, the teacher's role is no longer to provide information, but to help the student to digest and use this information. This can be done through exercises or practical works done in class under the supervision of the professor and by asking students to present, to the class, the information they have gathered during homeworks.

In terms of research, the problem is more complex to solve. If anti-plagiarism tools can help solve the problem of "copy and paste" it is not the main issue. At this stage, it is difficult for me to see clearly if the concept of professional social network can or will prove to be one possible approach to help researchers to stay aware of what is happening in his field of research without having to read tons of documents which are almost empty of information. For the moment the existing professional social networks, such as LinkedIn or ResearchGate tend more to encourage to the explosion of publications than to help researchers to synthesise what is going-on in his field of research.

Where do you need other disciplines and how can they help you to improve your strategies to face the 21st centuries challenges?

As computer scientist and especially as working in the field of HPC, my domain is mainly driven by other disciplines. "Grand Challenge Applications" such as climate modeling, genetics or manufacturing and simulation of complex systems are driving factors for the research in the area of HPC.