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Autonomous Systems: Developments and Trends

Studies in Computational Intelligence, Volume 391

Editor-in-Chief
Prof. Janusz Kacprzyk
Systems Research Institute
Polish Academy of Sciences
ul. Newelska 6
01-447 Warsaw
Poland
E-mail: kacprzyk@ibspan.waw.pl

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and Janusz Kacprzyk (Eds.)

Autonomous Systems: Developments and Trends

Springer

Editors

Prof. Dr.-Ing. habil. Herwig Unger
Fernuniversität Hagen
Fakultät für Mathematik und Informatik
Universitätsstr. 27
58084 Hagen
Germany
Phone: +49 2331 9871155
Fax: +49 2331 987353
E-mail: herwig.unger@FernUni-Hagen.de

Prof. Janusz Kacprzyk
Systems Research Institute
Polish Academy of Sciences
ul. Newelska 6
01-447 Warsaw
Poland
E-mail: kacprzyk@ibspan.waw.pl

Univ.-Prof. Dr.-Ing. Kyandoghere Kyamakya
Alpen Adria Universität Klagenfurt
Institut für Intelligente Systemtechnologien
(Smart System Technologies)
Universitätsstraße 65-67
9020 Klagenfurt am Wörthersee
Austria
E-mail: kyandoghere.kyamakya@uni-klu.ac.at

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Foreword

The Workshops on Autonomous Systems emanated from a gathering with the doctoral students of just three chairs at Fernuniversitt in Hagen, which we organise twice per year for a number of years now. Their purpose is to discuss on-going research and to create a community spirit. Furthermore, they serve as a means of structuring the students' research processes.

It is not suitable to conduct such a meeting on one's own premises, because there are too many disturbances and one cannot really escape from the daily routine. For its research-related events Advanced Study Institutes and Advanced Research Workshops NATO thus used to require in the corresponding guideline to carry them out in relative seclusion. Following this approach, in spring we meet in Schloss Dagstuhl, the Leibniz Centre for Informatics, which fulfills these requirements.

To change locations, we looked for another secluded place for the autumn meetings. Comparing offers of a large number of facilities, some of which just a few kilometers down the road, revealed that the most economic solution was to fly to the Mediterranean island of Mallorca with a low-cost airline, and to take advantage of special offers holding for the last week of the season before hotels close for the winter. After a first try, we found a hotel in an isolated bay, but still easily accessible by bus from Palma — in other words: we found relative seclusion. In this hotel, the workshop takes place now for the third time. The workshop has grown and matured in several respects. The doctoral students presenting their work do not come from a single university anymore, but from three. Besides them and their supervisors, also other scientists became interested in the event and contribute to its programme. Following the model of Advanced Study Institutes, they are available on the premises for relaxed, informal discussions outside the formal sessions. Finally, with the cosponsorship of Gesellschaft fr Informatik, the German Computer Society, and this surprisingly comprehensive volume of contributions published by Springer-Verlag the workshop turned into a visible scientific event.

Besides its educational and scientific purpose, the workshop in 2011 is dedicated to the celebration of my 60th birthday. Moving into the grandfather age, I am particularly happy that many participants, several of whom are former doctoral students of mine, come with their families including children and even two newly born babies.

So, I cordially thank all persons having organised and contributed to this workshop, I appreciate the willingness of Gesellschaft fr Informatik to act as co-sponsor and of Springer-Verlag to publish this nice book.

I do wish all participants a good time, that they have some fun and interesting conversations.

Hagen, June 2011 Wolfgang Halang

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Laudatio in Honour of Prof. Dr. Dr. Wolfgang A. Halang

by Prof. Dr. Matjaž Colnarič

It was with my greatest pleasure that I accepted the invitation from the organisers of this conference to prepare a few words in honour of Prof. Dr. Dr. Wolfgang A. Halang's 60th birthday. I have known him for twenty three years and I was his first PhD student. Since then, we have done a lot of work and spent many beautiful hours together.

In the mid 80's of the previous century, long after finishing my master's degree, when I was doing a lot of industrial research and was already lecturing for some years at the university, I realised that I should have started with my doctoral studies long ago. I read some papers and got a feeling that my experience from our previous work was pretty much in line with what I read about real-time. I tried to define a thesis but, being stubborn and picky about the domain, I did not find much support in my environment. So, I gathered the courage and submitted a paper on one of our applied projects to SERTA, an international conference in Cirencester. Surprising for me at that time, it was accepted and I gathered funds to attend it. I was looking for somebody to help me with my thesis there and I ran into a person who was immediately ready to talk to me and, shockingly quickly, agreed to supervise my work. That is how I met Prof. Halang and became his first doctoral student.

Prof. Dr. Dr. Wolfgang A Halang received a doctorate in mathematics from Ruhr Universityät Bochum in 1976, and a second doctorate in computer science from Universityät Dortmund in 1980. During and immediately after his studies, he was a part time employee at Coca Cola GmbH in Essen for nine years. After his second dissertation, he has spent a couple of years travelling the world, lecturing and researching for two years at the King Fahd University of Petroleum and Minerals in Dhahran, Saudi Arabia (1986-87) and another year at the University of Illinois at Urbana Champaign in US (1987-88). When he returned home, he led the Department of Control Engineering at Bayer AG in Leverkusen and Dormagen before he was appointed to the Chair for Application Oriented Computing Science and head of the Department of Computing Science at the University of Groningen in the Netherlands in June 1989. Since October 1991, he has held the Chair of Information Technology at the Faculty of Electrical Engineering at Fern Universityät Hagen in Germany, where he also served as the Dean in the years 2002-2006.

His research interests comprise all major areas of real time systems and domains related to them. He wrote a large number of pier-reviewed journal and conference papers, and authored or co-authored a number of books and book chapters. He has organised important and successful scientific conferences, of which I would particularly like to mention the Workshop on Real-Time Programming, which is probably the oldest series of scientific meetings in the domain of computer control. I am happy to report that this series will be revived as a track of the newly organised triennial conference CESCIT (Conference on Embedded Systems, Computer Intelligence and Telecommunications) in April 2012 in Würzburg, where he will serve as the Honorary Chair.

On the national level, Professor Halang is chairing the Expert Committee on Real-Time Systems (Fachausschuss Echzeitsysteme) of German Informatics Society (Gesellschaft für Informatik) and is one of the driving forces of the PEARL-Meeting and Real-time Systems Conference (Pearl Taggung and Echtzeitsysteme).

He has served as an official in international professional organisations. For two terms, he was chairman of the Coordination Committee on Computers, Cognition and Communication of IFAC, the most important world association of control professionals. For a number of years, he was European editor of the important specialised International Journal of Real-Time Systems, published first by Kluwer, then by Elsevier.

He is a mentor to young researchers in the broader domain of real-time and safety related systems; he supervised a number of doctoral students. He is also renowned for choosing his candidates not only from German universities, but also from other countries, of which China, Poland and also Slovenia prevail. With institutions in these countries he actively maintains successful professional collaboration.

The list of Dr. Halang's scientific and professional engagements does not end here. I apologise for my lack of knowledge of all his involvement, especially in the German national professional community.

Everybody who knows Prof. Halang will probably agree with me that he is not just another professor or scientist, but an interesting and unique person with some very specific personal characteristics. In the following, I would like to point out some of them, which I find that represent him the most. I am sure Professor Halang will not mind if I respectfully share some fragments of my recollections of times and events spent with him, just to illustrate some of these characteristics.

The scientific work of Professor Halang is characterised by *innovation*. For example: In his early works, he introduced an innovative asymmetrical multiprocessor architecture for dedicated functions and its implementation. During our collaboration on my doctoral thesis, I often came to a point where I could not find any reasonable solution. His very frequent advice in such cases was: "Querdenken! Do not think the way everybody else does, try to consider things from an unusual aspect."

On the other hand, through his rich experience and broad knowledge, he often shows that a lot of problems, which eventually emerge, have already been dealt with before, possibly in another form. Often the solutions can still be reused, at least as a basis for implementation in new technologies. Especially in informatics, things often reappear in circles, like multiprocessing, distributed processing, clusters, clouds, etc.

Furthermore, he is "allergic" to papers dealing with scheduling. As he often states, the scheduling problems have essentially been solved in the early 1970s. Many of the authors of later papers only use this domain in order to exhibit their perfection in creating problems and proving correct their useless solutions as well as their inability to take delight in other sophisticated academic theoretical domains. Let me add my personal experience here: I once had to review a scheduling paper. I struggled through the formal descriptions of algorithms, theorems, proofs and lemmas until the authors concluded that their solution almost meets the performance of random scheduling.

One of his significant personal characteristics is his *frankness*. I cannot imagine anyone saying Prof. Halang was not sincere to him or her. That was not always good for him and did not help him to make a lot of convenient friends. For example: In general, he is not very fond of our friends over the Atlantic. This is mainly because of their attitude towards the rest of the world, at least in our domain. He does not hide his opinion and, in return, they have often ignored him. Although he is very precise in correct use of English, which became lingua franca of science and technology, we heard him joking that English is an underdeveloped ancient dialect of German.

Once he decides on a certain reasonable and good solution, it is usually not easy to persuade him to use any other, less perfect one, just because it is easier. It was the same when our collaboration on my doctoral thesis began.

At that time, in the late 1980s, he has just returned to Europe and was stationed in Groningen, in the Netherlands. Since he was reluctant to use the traditional phone and mail communication, our first technical problem was to establish an electronic communication channel; electronic mail then was not very common nor usual or reliable, especially in our part of Europe. The problem was that we were using VAX VMS operating system at our university, which was totally incompatible with Unix on Sun workstations used in Groningen, which also pertains to communication protocols. The addresses on his side were formed using a proprietary-standard UUCP (Unix-to-Unix communication protocol) by "bangs" or exclamation marks (in the form of !site!machine!user). After some shaky and more or less unsuccessful attempts, two gateways have been written for us; one residing in Groningen and another one in Belgrade, converting addressing standards between European Academic Network EAN (X400) used by us, and the Unix protocol. The solution was definitely not easy, but after some initial hiccups, it worked excellent and saved us a lot of trouble in communication. I mailed him weekly reports on my research and he commented on them and proofread the final versions. Eventually we had lot of materials ready for editing my thesis and joint publications afterwards.

If I would have to decide what is, in my opinion, his ultimate maxim, I would not hesitate. *Simplicity.* During our intensive collaboration, he was never satisfied with

any of my sophisticated solutions, regardless of how perfectly they have complied with the requirements. Of course there was always a good reason for that simple solutions are easy to understand, prove and believe.

He always likes to use nice quotations from wise men, especially in the context of praising simplicity. Allow me to repeat some of them, which always still come to mind whenever I run into a nice and scientifically looking, overly complex, sophisticated and publishable solution to a simple problem:

1. Simple solutions are the most difficult ones: they require high innovation and complete intellectual penetration of issues.
2. Progress is the road from the primitive via the complicated to the simple. (both by Dr. Kurt Biedenkopf, professor and former Prime Minister of the State of Saxony, 1991 and 1994, respectively)
3. I also remember him making jokes especially on the account of informatics, citing Edsger Dijkstra's statement from 1989 that "It is time to unmask the computing community as a Secret Society for the Creation and Preservation of Artificial Complexity" or, as Professor Halang better puts it, Complicatedness.

Related to the simplicity, he always advocates *minimalism*. For example, he always travels lightly, never with luggage that would have to be checked in. Many of us know his famous little old brown suitcase, which is always large enough for his luggage, regardless of the season and the duration of the travel. And his plastic bag with fluid toilet utensils with the average volume of a couple of millilitres, with which he likes to impress airport security people so much.

Once at Graz airport in Austria, my usual departure site, going to one of our joint trips to Hong Kong, I realised that I had forgotten my reading glasses. They offered me a pair that was about one centimetre wide and was kept in a cartridge of the shape and size of a larger body-thermometer box in the duty-free shop. When he saw it, he said, with admiration and even slight envy: "This really is minimalistic".

Another one of his very personal attitudes is his reluctance to spend any resources on unnecessary expenses, like taxes, postal or bank fees, expensive flight tickets or excessive conference fees. Let me be very clear that he is far from being avaricious. He just does not want to get ripped off, if not absolutely necessary.

In 1996, I received a DAAD grant as a young academician for a visit to Hagen, where we worked on our joint publications. In order to minimize the expenses, Prof. Halang and his family very generously hosted me in their home for the whole month and made me feel as a real member of their family along with his devoted wife Berta and their children Andrea and Mathias. One morning he had to leave for a short trip by train and asked me to drive him to the train station with his car. Unfortunately, I got caught by stationary radar violating a speed limit of 20 km/h for 5 km/h due to a road reconstruction. After a few months, he told me what happened: he received a photo and a fine ticket for 20 DEM. He sent the letter back saying that it can be clearly seen from the photo that he was not the one driving the car. The driver was a guest academician from abroad whose identity he is not willing to reveal. He does not think he is responsible for the fine, but will pay it if they insist. The letter never came back.

He studied and, I am sure, still follows the tax legislative thoroughly and takes tax declaration very seriously. He once said his goal was to make it like his neighbour dentist, who never pays taxes and even gets some money returned. Once his tax declaration was not accepted by a clerk at the tax office. He complained, referring to certain articles in the law, but without success. Of course he did not give up; he wrote to the finance minister, saying that his employees were incompetent of reading their own legislation. His complaint was granted.

I am sure many people could add a lot more of his personal characteristics, events and anecdotes but this is how he is permanently residing in my personal pleasant recollections. Dear Professor Halang, we wish you good health and happiness among your dearest. All of us gathered here to celebrate your sixtieth anniversary are looking forward to many coming years of friendship, to spending a lot of nice hours together, meeting in beautiful places and, if really necessary, successful collaboration in our common domains!

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