



An Interview

with **János D. Pintér**

by **Tatiana Tchemisova** [University of Aveiro]

János D. Pintér is an applied mathematician, technical author, algorithm and software developer, as well as an entrepreneur. He holds an MSc specializing in Operations Research from the University of Sciences (ELTE) in Budapest, Hungary. He also holds a PhD in Probability Theory and Stochastic Optimization from Moscow State (Lomonosov) University; and a DSc in Mathematics awarded by the Hungarian Academy of Sciences. Dr. Pintér owns and runs Pintér Consulting Services (PCS) since 1994; his company is incorporated in Canada.

The research of Dr. Pintér is devoted to the development, computer based implementation and application of optimization models and algorithms which have been applied to tackle a broad range of decision problems. He is the author and editor of several books: he was awarded the INFORMS Computing Society Prize for his monograph *Global Optimization in Action*. He is also the author / co-author of over 200 book chapters, articles, proceedings volume contributions, and technical reports. Dr. Pintér serves or has served on the Editorial Board of the book series *SpringerBriefs in Optimization*, the *Journal of Global Optimization*, the *Journal of Applied Mathematics & Decision Sciences*, *Algorithmic Operations Research*, the *International Journal of Modeling, Identification and Control* and on the web-forums *GAMS Global World* and *GAMS Performance World*. Among many other affiliations, he is a former Chair

of the Managing Board of EUROPT (the Continuous Optimization Working Group of EURO), and a former Vice-Chair of the INFORMS Optimization Society. He is also a CORS and INFORMS Speaker, and he has worked and presented lectures in more than 40 countries of the world.

In September of 2014 Dr. Pintér visited Portugal as an invited lecturer at the EngOpt 2014 conference in Lisbon; he also presented a two-day intensive course on Global Optimization at the University of Aveiro (UA). The course was organized by APDIO, Portuguese Association of Operations Research and supported by the Department of Mathematics of the University of Aveiro and CIDMA, the Center for Research & Development in Mathematics and Applications. Dr. Tatiana Tchemisova, an Assistant Professor at the Department of Mathematics organized the course and interviewed Dr. Pintér. The following notes are based on this interview.

**TATIANA:** You have a long experience of living, studying and working in different countries. You were born in Hungary; studied and worked in Moscow (at the time of the Soviet Union); studied and worked in Australia, Canada, Hungary, Indonesia, the Netherlands, Turkey, the United States, and other countries. What had stimulated you to leave your country for the first time to study, and how do you feel now about this – I mean leaving and working so far from your country? Do you consider yourself Hungarian, Canadian, or a Citizen of the World?

**Janos Pintér:** Dear Tatiana, you have asked a complex question. I will try to answer it in a reasonably short, but truthful manner. First of all, I think that in this age, every sufficiently interested person is a Citizen of the World in many ways. Here I assume the intelligent use of the information sources and knowledge directly available to billions of people today. Unfortunately, there are still many among us who are deprived of the privilege of free-flowing information due to sheer poverty or dictatorial restrictions, but this will change – hopefully, sooner rather than later. My motivation to leave my homeland is based on a combination of personal and professional reasons, and probably also a desire for adventure. I lived in Hungary approximately the first half of my life, while lived elsewhere in the second half (so far). To be honest, although one never forgets his origins and the positive influences associated with these roots, I am probably more of a Citizen of the World than “just a Hungarian”. This is reflected by my overall views; the way I try to live, to work, and to interact with people. My views and opinions are related also to many aspects of politics, economy, culture (arts, books, music), and even to culinary preferences.

**TATIANA:** You have received a “classical” academic education, and worked at several universities and research centers. How had it happened that you turned into an entrepreneur, started your own business? Did you have any support (organizational and financial)?

**Janos Pintér:** Here is another difficult question... The reasons for becoming an independent researcher and entrepreneur have probably a lot to do with my character, in addition to many good and some less fortunate circumstances. I enjoy working alone and independently (and I don't take too well instructions from people based on their perceived position or power). Having said that, I also have had the good fortune to work with many hard-working, professionally motivated, decent and kind colleagues. I did not have a lot of resources when I started my business, and my (in my own views) modest achievements and success are solely based on steady work, adaptation, and – arguably – also some luck.

**TATIANA:** Today Global Optimization is a very popular area of research. How could you characterize the State of the Art? How could you characterize the main directions where the research is more active nowadays: theory, applications, software development?

**Janos Pintér:** Global Optimization (GO) has been an almost non-existing “boutique discipline” of Operations Research and Optimization until recent decades, in spite of its obvious importance in many research areas and real-world applications. These days, GO is also a prominent and popular “academic research” area. Such recognition is great, of course, but in my opinion a purely “academic” approach to the topic can have also its negative side effects.



**J.Pinter presenting his course “Optimization Models, Algorithms, Software”. University of Aveiro, September 2014**

When a subject – or tiny portions of a subject – becomes “baroque” or “rococo”, then it is time to adjust the course of the ship and to move on. As the great George Dantzig said, “The final test for a theory is its capacity to solve the problems which originated it”. In academia, it is too often considered more “glorious” to introduce another concept and to prove another fact that may or may not be that important in the true sense of scientific achievement, than to solve a really difficult GO problem arising e.g. in areas like cancer therapy, computational biology, facility location, industrial object packings and so on. In my opinion, GO theory and applications should proceed together in salient proportions; and topical software development is a key factor in tackling many real-world problems.

**TATIANA:** How can you describe the current situation in the (GO) software market? Is the competition tough? Are the needs of users met? In general, is it a good business?

**Janos Pintér:** In my opinion, the scientific-engineering software market is very competitive: the typical users of optimization software are clever colleagues and peers who demand high quality, in terms of robustness, reliability and efficiency. There exists also a range of freely available software products for nonlinear optimization: some of these can be very good, while others are inferior. People most typically purchase professional software products because they don't have the expertise and / or the resources to figure out things without proper technical support and user guidance. Selling optimization software and offering related services is



**J.Pinter with the participants of the course. University of Aveiro, September 2014.**

a good business if done properly; for me, it is also a professional and intellectual challenge – as well as some good fun.

**TATIANA:** How many people work in your company? Who are your clients? Do you collaborate with other software companies?

**Janos Pintér:** I am the sole proprietor and the only permanent employee of PCS – from president to janitor, not to mention other professional needs like legal, financial, marketing expertise, diplomacy and psychology.. There is never a boring moment which is arguably a good thing. I also work with a select group of developers on a regular basis, and with leading modeling language and computing system developers on links to their software products. As of today, our past and present clients come from about

500 academic, business, consulting, and industrial organizations around the world.

**TATIANA:** You are both researcher and businessman. Is it easy or difficult to combine these two activities? How do you manage your time and the work?

**Janos Pintér:** To work on a research topic or to discuss company finances, sign legal agreements etc. are very different activities. I don't find it too easy to combine these, hence my usual approach is to allocate time to all work as needed, in some order of preference. (This is not necessarily easy either.) On the positive side, I have considerable freedom and flexibility with respect to project selection and the allocation of my work hours – as long as I work in my own home office. Being on the road as a consultant or lecturer has its own challenges and rewards.

**TATIANA:** I imagine that the world of software development is very competitive, and it is important to keep certain “secrets” related to proprietary software. In science, on the contrary, it is important to share ideas, publish detailed results, while retaining the author’s rights. Do you feel any imbalance because of this?

**Janos Pintér:** Indeed, this aspect makes the publication and presentation of results more difficult, since some of my favorite ideas in algorithm and software development can be presented only on a generic level. Having said the above, it is far from trivial to reproduce someone’s (complex) ideas in a professional level software product.

**TATIANA:** Professional software development partnerships have been established between PCS and some well-known software companies such as AMPL Optimization LLC, the GAMS Development Corporation, Lahey Computer Systems, Maplesoft, Maximal Software, Paragon Decision Technologies, TOMLAB Optimization, Wolfram Research, and others. How do you manage the partnership?

**Janos Pintér:** As I said earlier, I am the designated legal expert of my company (since there is no legal department): hence, I have to work out and sign all legal agreements. Occasionally a morsel of diplomacy is also required, since my business / developer partners are also people.

**TATIANA:** Have your company felt the influence of the recent economic crisis and how have you resisted? What changes have you made in your work?

**Janos Pintér:** Quite frankly, I felt very little change in terms of real customer demand due to the economic downturn. The type of service offered by PCS and by

similar companies is a range of professional software products that are not so easy to reproduce or surpass in quality. Nonlinear optimization software is not some “fashion fad”; it is vitally required by many real-world applications. The price of such software is typically a fraction of the resulting benefits for an organization.

**TATIANA:** I know that you are working on several book projects at this time. Which type of readers you have in mind: students, teachers, industrial users? Can you list three key features that will distinguish these books?

**Janos Pintér:** Indeed, I have several book projects in the works: each of these have been contracted by Springer Science + Business Media. To be more specific, I am working as time allows on three different, but obviously related books which discuss model development and optimization with Maple, Mathematica, and Matlab. I also work on a book project that discusses the practice of nonlinear — global and local — optimization. In addition, I also work on edited volumes as co-editor.

My main objective is to provide practical and actionable guidance to readers who wish to use nonlinear optimization in their work. I also attempt to write in a lively and engaging style that – hopefully – will make my books enjoyable to read and profitable to use. Hence, the readership could come from all walks of academia and practice with the type of mindset which is in synch with the objectives summarized above.

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