

Respected Face

Elsa Jordaan



Elsa Jordaan comes from South Africa. She finished the OOWI program Eindhoven in 1999. Elsa did her final project on “Support Vector Machines” for DOW Benelux B.V. and continued the project as a PhD thesis. Now Elsa works at the Dow Corporate R&D Department as a research engineer, and is a problem owner of projects that are carried out by the Mathematics for Industry program. We met on a warm Sunday evening in a café at the Eindhoven train station. The interview did not take long - Elsa had to return to Terneuzen where she lives. I should have asked for three hours at least! From the first minutes of our talk Elsa struck with her wit, the ability to pick up the essence of any question, make strong statements and defend them, and with her irresistible charm. This is her story.

Her profession

I am a professional student because I never stop studying, exploring, investigating. I do it professionally, every day.

Current position

I tackle research problems on different projects. My job description is a research engineer. Research is the part where we need to investigate and find the solution; engineer is the part where we have to think what we do. Everything we do should not remain on paper. Finally it has to be implemented for the benefit of the company.

Special features of the job

Usually you run up against problems that are not solvable theoretically. You have to come up with a practical solution. I can formulate the problem and a solution in math terms. However, the guy next to me doesn't necessarily want the formulae. Therefore we have to come up with a clever way to hide all the mathematics behind

By Catherine Vladislavleva

something, so that it can be interpreted. This is one of the most challenging aspects of problem solving in engineering.

OOWI program

I did my bachelor degree in chemistry and applied math in South Africa. I then started with my Masters in applied math. In the 5th year I said to myself: "I am studying industrial math, but I have not seen a single thing of industry!" Then I started looking for a job. The first question at the interview was:

-Okay, can you program? Then we can put you to our computer science department.

-But that is not what I want to do! I am a mathematician!

What can you do in industry with a green applied mathematician?... Then my mentor told me: "In Eindhoven they have this program Mathematics for Industry. You follow that program; that will make you ready and give you the necessary skills and knowledge to actually use your mathematics." So, that is how I joined the program. And that is the best thing I have ever done... Truly!

I ended up in a company for which I have exactly all the skills and the knowledge to perform my work on a standard which is ... good enough. (I do not say excellent, because then I am boasting). I am well equipped for the job I am doing. And that is all because of the program.

What was the best thing to learn

I have learned many things apart from mathematics. The best one was conflict handling in a team. Some people do things in a different way than I do. I have learned in the program how to listen to people and see their points of view.

I also learned how to write reports - it is something I have to do every week. And time management skill was also very important.

Apart from the whole professional development, the program can make the student sufficient (to work in industry). You can possess the knowledge on all the parts

of mathematics, but if you cannot communicate with your colleagues, then you are not an industrial mathematician. We work in teams. One of the most important things that this program has given me is working in teams on a project, knowing that I have to deliver something to solve the problem.

Where to improve

The program has changed a lot over the years. I think for the better.

What can be promoted more or trained more is the communication, for example the ability to talk about our work on a non-technical level. I see that students tend to dive into the details too quickly. Most problems we have had were because of the lack of communication skills.

A more technical kind of problem is the ability to use standard software. Sometimes I just get frustrated with Word, but half of the time it is just my lack of fully understanding the package. Therefore training students to use Word and Excel and fully use these would help.

Everyone in the program (not only B-stream) should have a sufficient knowledge in statistics. In every report you write you should think about the data and know what you are talking about. It is often a problem when people do not have enough knowledge. When you get your data you have to calculate confidence limits, error bars, you have to find out if there is a statistical significance or a statistical difference of two sets of data. Only then you can actually go on with your modeling.

Dream comes true

On the final project I showed the interest in doing the design thesis. So I continued in Dow doing my PhD on Development of Robust industrial applications of support vector machines for regression. And I would not have done it anywhere else!

If you intend to work in industry, staying at a company while doing your research is the best option. I could check my results on industrial data. I had the opportu-

nity to get to know the company. Most of all I had to come up with solutions that were not completely theoretical, but applied!

I always said: "I would not do a thesis at a university. I am not the person to do that." And I didn't want to break the communication with industry. To work there during 8 months, and then to leave for 3 years, would mean I loose the contact. -No!

When I left South Africa I did not plan to stay in the Netherlands. My plan was to go back when I finished the program. Then the idea of PhD came forward. That was everything I dreamed of. I always wanted to be highly educated. When I was in South Africa I did not want to do a PhD, because I did not want an academic career. I wanted to do industrial applications. When I got the opportunity to do an industrial PhD here I thought: "Maybe I can still make my dream come true."

Why the Netherlands?

You change your opinion on many things. At the end of my research I had to think about a place to work seriously. Dow had promised me a job even during my final project. For me, it was always a possibility to stay. When I went to South Africa for a vacation, I realized that for me it was very difficult to make a career over there. All my experience was European. And that did not work in South Africa. I realized that the type of the job I wanted was the possibility to be an applied researcher. In South Africa I would not have been able to do that. Then I realized that my mind set has been changed. The companies in South Africa were not suitable anymore. I still wanted application AND research. So I decided to stay here.

IM essentials

There are four essential skills for an industrial mathematician:

- being an expert in our area,
- being an innovator coming up with ingenious solutions,
- being communicative - talking about what you are doing on a level that managers, who are scared by a

function $y = f(x)$, are able to understand what you do, - and being a salesman promoting our solutions.

Are we needed?

We are definitely needed. At this stage companies want to save money every day. The only way they can save money is by improving processes, making more money in less time with less people. And that is where we come in and make it possible to do that.

I think the only problem at this time, as the economy is low, is that companies do not hire in new people. It does not mean that the job is not there or that they do not need us. It just means that the economy experiences a bad moment. If you look at the broader picture, Europe is moving to what is called a knowledge economy. In that economy we play a crucial role.

Elsa as an industrial mathematician

I truly believe in what I say. I am an inventor - I create inventions. I am a teacher - I should train the people I am giving a solution to, give them an explanation of how to use it; I have to be an expert. And I also have to be a salesman. I have to convince the guy who pays me: "I am worth your money!" Our job is not simply a matter of given a problem, find a solution. It is given the problem, find the solution, explain this solution to others, implement it, and sell it. That is what I am required to do as an industrial mathematician, and fortunately I do it in my job at Dow.