POWERING THE INVISIBLE ENGINE

”Vital software shapes society”. That is the catch phrase the Dutch National Association for Software Engineering VERSEN has chosen to launch its recently finished manifesto. VERSEN board members Marieke Huisman, Patricia Lago and Alexander Serebrenik share their thoughts on the future of Dutch software research. ‘Software is the engine that powers all computer science developments like AI and cyber security. Although for many people this engine is invisible, it is so fundamental that we need to understand how to do it right.’

Text Sonja Knols
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‘The Dutch software community is well organised,’ Patricia Lago says. ‘That enables us to come up with a broad-based manifesto that showcases the importance of software research, the challenges we identified, and the areas we excel in.’ ‘And what’s perhaps even more important: that we have the right people to address these challenges,’ Alexander Serebrenik adds.

Need for software research

The time was ripe to draw up a joint vision document about the future of Dutch software research, the three say. ‘In most of the recent science policy documents, software is conspicuously overlooked, although it is a fundamental part of computer science research. No matter how nice a new machine learning application might be, if the software is bad, the entire thing fails to work,’ Lago illustrates. ‘Like never before we need software research on how to create reliable, sustainable software in an efficient way.’ In the manifesto, the software research and education community describes a number of challenges imposed by the demands of the

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digitising society. Modern software used in cars, aeroplanes, operation robots, banks, healthcare systems or the public sector, comprises millions of lines of code. To produce such software, many challenges have to be overcome. How do we develop this software and simultaneously master its complexity? How do we ensure the correctness and security of this software, as human well-being, economic prosperity and the environment depend on it? How can we guarantee that software is maintainable and usable for decades to come?

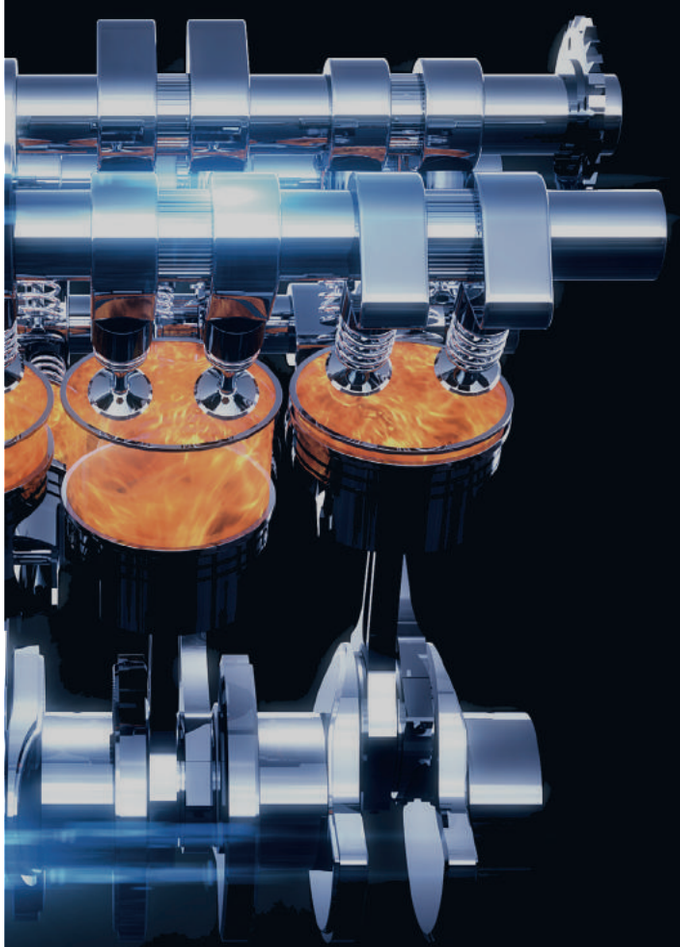
Currently, Dutch software research is under siege, due to a steep increase in the number of students enrolling in computer science programmes. 'Of course, it's a great development that we are able to attract a growing number of people towards our field,' Marieke Huisman hurries to say. 'Especially since the job market is craving for qualified personnel. But since education has clear deadlines, too often research has to pay the price of the growing pains.'

Community building

The process of drafting the manifesto has acted as a fertile exercise in community building, Huisman says. 'From the start, we have involved all of the group leaders in setting up the manifesto and in agreeing on the main research themes for the imminent future. We think it is important that everybody knows what others are working on, even if their area of expertise is a little further away from their own.' 'It is energising to see how the community is evolving,' Serebrenik adds. 'Over the last few years, a number of people has been appointed. This manifesto helps them in sketching the landscape and determining how their work fits in.'

The next step is getting the message across to policymakers. IPN plays an instrumental role in that process, Huisman thinks. 'Being one of IPN's Special Interest Groups, we benefit from their contacts with policymakers on a national scale.' 'IPN is instrumental in organising the computer science field, and representing it with one voice towards, for example, the Ministry of Education, Culture and Science,' Lago adds. 'As a software community, we are also benefitting from IPN in other ways,' Serebrenik says. 'For example, we gratefully make use of their activities and insights to increase diversity in the world of ICT.'

Eventually, the VERSEN board members hope that their manifesto will create awareness among policymakers with regard to the importance of software research and innovation. 'Implementing software will affect society – willingly or not. Take developments like smart cities, self-driving cars or even things like dating apps, which have altered the way we communicate with each other. These things don't happen by magic. In the end, it is all about software.'



VERSEN SOFTWARE MANIFESTO

In its manifesto, the Dutch software research and education community explicitly lists four groups of challenges it is in a perfect position to address:

1. **Software reliability. How do we ensure that complex software behaves as expected, does what society needs, and is robust against unexpected uses?**
2. **Efficient engineering. Software engineering is exceeding human scale in terms of velocity, volume and variety. How do we keep pace?**
3. **Software maintainability and evolution. How do we create software with a long operational life that can be evolved and migrated to new technologies in a cost-effective way? And how can the software engineering team be organised in such a way that it embraces change and facilitates sustainable maintenance and evolution?**
4. **Software education. How can we supply the job market with well-equipped and highly qualified personnel from a diverse background?**