VORtech

scientific software engineers

Who are we?

We are enthusiastic scientific software engineers, data scientists, and mathematical consultants. We started in 1996 as a spin-off from Delft university of Technology. Since then, we have steadily grown into a company of more than 25 professionals. Most of us hold a PhD-degree in mathematics, computer science or physics.

We are specialized in developing and accelerating software for large-scale computation, simulation, prediction, monitoring and optimization. And we love to help our customers by solving their data-science and mathematical problems.

We work for major corporate, academic and governmental organizations, often as a specialized partner for their R&D department.

$$\frac{\partial}{\partial z}\left(\,\right) + \frac{1}{r}\frac{\partial u_\theta}{\partial \theta} + \frac{\partial u_z}{\partial z} = 0$$

$$\frac{u_\theta^2}{r} = -\frac{1}{\rho}\frac{\partial p}{\partial r} + v_c\left(\right.$$

$$\frac{u_\theta}{r} = -\frac{1}{\rho r}\frac{\partial p}{\partial \theta} + v$$

$$\frac{\partial}{\partial t} + (u \cdot \nabla)u_z = -\frac{1}{\rho}\frac{\partial p}{\partial z} + v_c$$

What do we offer?

Building computational/simulation software

We develop new computational and/or modelling software, either as a stand-alone application or as an extension or add-on to existing software.

For example: for an engineering firm we implemented a model to describe the night glow that is caused by city lights. This software is used to predict whether new building plans will exceed the limits on sky glow set by environmental law.

Maintenance, extension and optimization of computational/simulation software

Much of our work is on maintaining, extending and optimizing existing software:

- Extending software: we are better qualified for this than standard IT companies, because we are able to understand the mathematics behind the software. In addition, we are used to dealing with the complex algorithms and data structures that are typical for this kind of software.
- Maintenance: In many cases, our clients outsource the maintenance of their complex computational code

to VORtech. We apply standard procedures to keep software up-to-date and well-tested.
- Optimization: Our experience in high performance computing helps us to create software that runs efficiently on today's most powerful computers.

For example: we've played a major role in the development of Rijkswaterstaat's software to predict flooding. Another example: We have made significant contributions to a model for global changes that is used by an environmental government agency to support policy decisions.

Data science

- Companies often have lots of data, such as sensor data and credit data. We are experienced in data exploration and in defining the business case with you.
- We apply statistics and machine learning to get (hidden) insights from your data.
- We develop software tools that can be used to analyze your processes, improve your monitoring targets, and predict the future.

For example: for a construction company, we helped to clean and interpret the data. Then, we constructed a statistical model to analyze their data. The model can be used to estimate their material bill, which gives valuable insights to the company.

Mathematical modeling

Before any problem can be solved with mathematics, it must be described in mathematical terms. We are experienced in this mathematical modeling.

For example: we helped a large asset-management company to make the best selection out of hundreds of proposed asset investments. Our contribution was the development of a mathematical description of the problem, so that analytical tools can be used to find an optimal solution.

Mathematical problem solving

Once the mathematical formulation of a problem is there, we can assist in solving it.

For example: for a leading producer of artificial fibers, we found a method to solve the mathematical equations describing one of their production processes. This finally gave the insight that the company needed to solve a nagging problem that was pestering the production process.

We are specialized in developing and accelerating software for large-scale computation, simulation, prediction, monitoring and optimization.

Consultancy on computational/simulation software

Finally, we help you answer any question that you may have regarding the use and management of computational software. Working in the field for more than 20 years and for dozens of customers, we've come across most of the issues that our clients face.

For example: we have counseled several customers on how to organize maintenance for their complex software. We also provided courses and workshops on the specific challenges in developing computational software.

Our mission

We want to bring you the latest and best in scientific software development, data science and mathematical consulting, with a highly qualified team in a project form that matches your needs.

At the frontline of technology

We are dedicated to bringing you the latest in technology and the best in skills. We maintain our high level of knowledge and experience by:

• learning in projects for the wide variety of customers that we serve,
• maintaining close ties with various Dutch universities,
• participating in international research projects, which not only makes us grow professionally, but also allows us to contribute to the advancement of our profession.

By hiring us, you connect to the best and latest insights in the field. We maintain a leading role in High Performance Computing and the use of observational data in combination with computational models (data-assimilation).

Dedicated to quality

If you involve VORtech in your project, you not only get highly qualified people. You also get an entire organization dedicated to your success. We constantly monitor the progress of our projects and will readily step in if our experience tells us that something could be done better or more effectively.

Flexible to match your needs

For us, each customer is unique. Therefore, we have organized ourselves to deliver our services in any form you want. Whether you want someone working part-time in your office or want to outsource an entire project, it is up to you. The only thing that is important to us is that our employees also spend some time in our offices to be in contact with the knowledge and experience of his or her colleagues.

We can deal with all common software environments. We work both under Linux and Windows. And we are capable in many different programming languages like C, C++, C#, Python, Fortran and Matlab.

We understand your challenge

Having worked for so many different customers, we have become quick learners. We pride ourselves in the capability to work with experts from many different domains to jointly solve complex problems. We are curious by nature and skilled in efficient and effective communication.

Frequently asked questions

When we engage new customers, some of the following questions often arise.

You are mathematicians, data scientists and software engineers. How can you help us if you don't know anything about our field?

Indeed, you probably know more about your specific application than we do. But we probably know more about mathematics, data science, and software engineering. The challenge is to bring your knowledge and ours together. Therefore, we select our colleagues for their ability to work with experts in other fields and jointly develop things that neither the client or us could have developed only by ourselves. And because our colleagues have seen different applications in previous projects, they tend to get up to speed in any application domain pretty fast.

How do you deal with confidentiality?

Compare us to a doctor. You know that he is not going to share your medical history with others. If he did, he would soon be out of work. It's the same with us: if we would ever breach confidentiality, it would mean the end of our business. This is probably an even better guarantee than an NDA (that we usually sign, nevertheless). We do take our experience with us, of course, but that is the very reason why you are hiring us in the first place.

How do you ensure that I can work with the software after you leave?

All software that we make or modify becomes yours; everything we do is delivered to you at the end of the assignment. Usually, we work together with your own experts so that they learn about what we do. We don't want our customers to stay with us because they cannot leave us. We want our customers to come back to us because they are impressed by our work and want to work with us again.

Do I hire one or more of your experts?

You can hire specific experts, but we prefer that you hire us as a company. Our expert knowledge on mathematics, data science and scientific software engineering is commonly shared among the colleagues, so that continuity of projects can be guaranteed for you. Moreover, we like to work with a VORtech team on your problems, because this maximizes the quality of our work.

Interested?

If you think that VORtech could bring value to your
company, feel free to contact us. We'd be happy to
come and discuss with you how we can help you.
In most cases, we start with a short project of just
a few days that gives us the chance to show what
we are worth. We're proud to say that we never
disappointed a new customer.

VORTECH

P.O. Box 260
2600 AG Delft
The Netherlands

Westlandseweg 40d
2624 AD Delft
The Netherlands

phone: +31 (0)15 - 285 01 25
email: info@vortech.nl
website: www.vortech.nl