Mathematical Consultancy

Many practical problems can be solved using mathematical techniques. VORtech's mathematical consultants know how to translate your problems into mathematics and subsequently solve them.

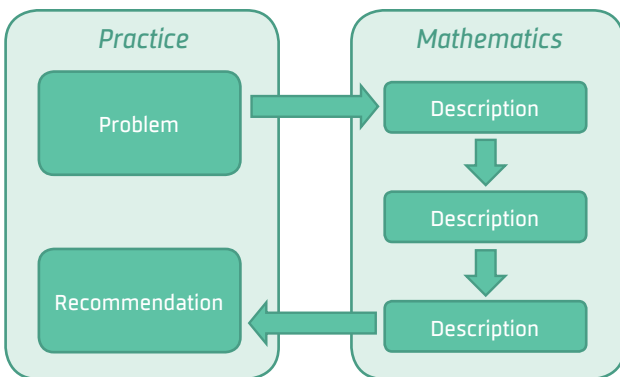Using mathematical techniques to solve practical problems.

Many practical problems can only be solved using mathematical techniques. For instance: planning optimal routes for a trucking company, analyzing the valuation of an investment portfolio or the efficient rendering of images for a computer game.

VORtech's mathematical consultants can solve these and other problems using their mathematical expertise.

A problem is first translated into mathematical syntax. A method for solving the mathematical problem is devised. Software may be developed to execute the necessary calculations. When the mathematical solution has been found, it needs to be translated, thus rendering a solution to the   original problem. VORtech's mathematical consultants are proficient in all these steps.

This is how we work
This diagram clearly shows what the process entails:

Any or all of the mentioned steps are executed, depending on the client's wishes and the nature of the problem.

The steps are explained in more detail below.

From a problem to a mathematical description
- A brainstorming session is held, in conjunction with the client, to map out the problem/challenge.
- A study of the field in which the problem plays, in as far as is necessary to understand and solve the problem.
- A study of the problem's context: the company's perspective, existing reports and models and existing programs.
- Devising a mathematical description. We research the problem further, consult experts in the field and deploy our own mathematical expertise.

From a mathematical description to a solution method
- A study of existing solution methods, again, if necessary, by consultation of experts and scientific literature.
- Development of a new method of solving the problem.
- Analyzing and effectuating the chosen solution method.

From a solution method to a solution
- Implementing solution methods in (existing or custom-made) computation software.
- Quick computation through high performance computing (HPC).
- Connecting computation software to other scientific software.

From a solution to a recommendation
- Presenting the results in form of a report or a presentation.
- Conveyance and recording of the work that was done and the results that were reached. This also entails providing the client with the technical documentation.

We operate in various fields

VORtech's mathematical consultants operate in various fields and apply many different mathematical competencies. These are some examples of recent projects:

- **Asset management** — An advanced optimization model was thought out and implemented to solve a practical asset management problem.
- **Climate** — Numerical tools were developed and installed into existing software for climate modeling. These were used to support european climate researchers.
- **Traffic** — VORtech designed improvements to the shortest path algorithm that was used in a mathematical traffic model.
- **Soil mechanics** — VORtech developed improvements to calculation matrices. These were used to calculate the stability of the soil under a construction.
- **Water** — Various new algorithms to quickly predict water levels were developed.
- **Oil and gas** — Algorithms in calculation software in the area of seismic models were improved and accelerated.

The unique properties of VORtech

Vortech's mathematical consultancy experts offer you many unique properties:.

- All of our mathematical consultants have a PhD or MSc degree. Their experience in analytical thinking and knowledge will support the client in solving his problems.

- Our consultants are proficient in translating problems into mathematical terms, whereupon they can solve it.

- Our consultants have the knowledge and tools to handle complex problems and large systems.

- Our consultants are also proficient in software engineering and high performance computing (HPC). They apply them to projects, thus creating applicable implementations.

About VORtech

VORtech is an independent engineering firm that specializes in mathematical modeling and scientific calculations software. Our highly educated mathematical consultants and scientific software engineers work for large commercial companies and institutes as well as for smaller companies. We develop, improve and support complex mathematical models and the corresponding software.

Interested?

For more information on the possibilities mathematical consultation has to offer your company, please contact

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