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# Continuous Constraints: Updating the Technology

## Results in Brief

### Maths, a problem or a tool to solve the problem?

Trial and error is often the only way to determine whether the right choice has been made. The EU-funded Coconut project suggests that if mathematical methods were applied before developing and testing a product or process, the outcome could be more accurately predicted.



DIGITAL ECONOMY



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Modern manufacturing and service industries have changed drastically over the last few years thanks to the increasing use of information technology. Even so, fast and inexpensive computing and the development and utilisation of large databases have necessitated sophisticated methods to meet new demands.

Mathematical algorithms together with the latest computing software have been the key enabling factor in implementing these methods to produce economic benefits. The optimisation methods in particular share the same objective, to do things the best way under the given circumstances.

This general concept has many applications in industry where the maximum profit, minimum cost or delay needs to be estimated. To tackle such complex industrial

problems by taking into account all available options, the Coconut project has developed modelling tools which translates them into mathematical expressions.

The beauty of modelling lays in its ability to breakdown a labyrinthine state of affairs to simple understandable concepts which permit even non-experts to uncover the most beneficial options. The new modelling tools reduce the apparent complexities by virtue of their intrinsic orderliness, thus bringing about the much needed simplicity and clarity.

An integrated user-friendly interface allows communication of different instances of the models formulated to a suitable solver and finds solutions to the system of equations. By systematically adjusting the value of variables that are particularly important when making decisions, a 'good' or the 'very best' solution can be selected.

Once a satisfactory model has been formulated, decision-makers will have in their hands a powerful tool to analyse risk factors and failure mechanisms. It can assist them in arriving at the very best decisions considering existing constraints and the potential to deliver a cutting-edge advantage over cut-throat competitors.

Since its first version distributed under the GNU General Public Licence in 2004, the Coconut software has been continuously expanded to include commercial and open-source components. The latest version is readily accessible at [http://www.mat.univie.ac.at/users/coconut/public\\_html/coconut-environment/](http://www.mat.univie.ac.at/users/coconut/public_html/coconut-environment/)

Project Information

COCONUT

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[Project website](#)

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