

OPEN CALL – LIVING INNOVATION LAB

Sensitivity Analysis for Model Quality

BACKGROUND & ADDRESSED CHALLENGE

Sensitivity Analysis represents a major step in simulation technology, irrespective of the underlying industrial sector.

It enables engineers to obtain results on model quality, i.e. it gives answers to the following questions:

- How well does the model depict the real system?
- How likely is the real system to fail?
- How do changes of model parameters affect model quality?
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Modelling & Simulation often infers huge efforts in terms of costs and time, and thus significantly slows down system development. Our goal is to offer technologies to support engineering in modelling and simulation activities for documented confidence in simulation artefacts, leading to strictly mandatory quality measures for virtual system development.



OFFERED TECHNOLOGY

Almost needless to say, system simulation always comes with uncertainties. For instance, measurement technology cannot overcome certain errors and some system parameters will always remain unknown. Our goal is to find input parameters that offer a good description of the model, keeping in mind the huge cost in time that simulation may infer.

To obtain results as soon as possible we offer a sensitivity analysis tool and service that

- generates adequate samples of input parameters
- runs simulations with given input
- performs analysis on the system, given input and simulation results and
- generates confidence reports for Modelling & Simulation engineers.

Our focus lies on correct sampling and analysis. Our methods aim to determine

- possible weaknesses in the parameters setting
- critical parameters concerning system failure and
- failure probability of the real-world system given uncertainty measures of real-world performance data.

We aim to analyse the model automatically to give hints on parameter optimization to engineers. Furthermore, we manage to identify bad system models as soon as possible and may hence identify unprofitable development steps beforehand.

EXPERIMENT SCOPE

We are seeking for industrial Modelling and Simulation applications where uncertainties in the model structure and model parameters are critical to the performance of related products. By the application of available Sensitivity Analysis tools and services uncertainties and confidence levels are identified for underpinning model and simulation quality measures.

Based on your industrial application, we first need to identify the required precision of the model output and hence need to estimate the distribution of the input parameters. Output data are generated by multiple simulations with data from the input sample. To keep the number of simulations small, we aim to approximate the distribution of the output. Hence, we require a thorough analysis of the model with technologies in Sensitivity Analysis (SA) that have already been proven successful in other areas. Those technologies may include python SALib package as well as cross-validation methods.

A concluding evaluation of the refined technologies in the form of a statistical experiment on the model from automotive development should lead to a publication.

The expected outcome of the experiments is further development of ideas and publication.

FUNDING OPPORTUNITIES

Aligned with the defined long-term COMET K2 research program **fast-track experiments (up to 6 months)** and **lighthouse experiments (7 - 12 months)** executed at VIRTUAL VEHICLE are public (co-)funded up to 50% based on a bilateral agreement.

Seed Actions for Start-ups and SMEs will be free of charge.

Your application will be reviewed by our Scientific Assessment Board. The board will evaluate the applicants proposals and select proper candidates. The final number of applications being selected in each call might be different. Only selected applications will be funded.

CALL INFORMATION

Call Opening	01/10/2020	Proposal language	English, German
Targeting Group	Start-ups, SME, mid-caps or LEs from EU member states		
Project Duration	Seed Action: first try-outs Fast-track experiments: 1 - 6 months Lighthouse experiments: 7 - 12 months	Indicative Total Budget	Seed Action: VIRTUAL VEHICLE support is free of charge Fast-track experiments: < 50.000 € Lighthouse experiments: < 200.000 €

If you have a promising smart idea, we are happy to receive your application!

Please use our online application form to send us your proposal and describe:

- In which technology field or discipline are you active
- Your planned application concept and its expected use
- The preliminary benefit
- The industrial relevance and potential impact of your experiment, as well as your plans for exploitation of the results and the future business outlook

Your experiments should be designed to be completed in a maximum of 6 months for fast-track experiments and a maximum of 12 months for lighthouse experiments.

Experiment proposals are very welcome from organisations located in any EU member state and must be written in English or German. Submissions done in any other language will not be evaluated.

Contact: lil@v2c2.at

By transmitting your proposal for the "Open Calls – Living Innovation Lab", you agree to our Data Protection Notice and that your submitted application will be evaluated by an expert jury of VIRTUAL VEHICLE representatives. Virtual Vehicle reserves the right to reject any application at any time without giving reasons. The decision is binding and final. The right to appeal at court is excluded. Further details will be agreed in a separate agreement between accepted applicants and Virtual Vehicle. Any liability of Virtual Vehicle is excluded, except as stipulated by applicable mandatory law. Furthermore, you confirm that the contents of the submitted proposal are independently developed by you without the use of confidential information from third parties and are free of third-party rights to the best of your knowledge.

LIVING INNOVATION LAB – CLOSING THE GAP



VIRTUAL VEHICLE funds SMEs, Start-ups, and Enterprises to experiment and innovate with new technologies.

The LIVING INNOVATION LAB facilitates the transfer of knowledge – from academia to industry and the development of highly innovative product solutions. Together with academic and industrial partners, VIRTUAL VEHICLE is trying to bridge “The Chasm” between investigating innovative concepts and early technology adopters by funded open call experiments.

Successful demonstrations of highly innovative technologies lead to a maximum benefit in exploitation and realistic chances for market uptake. For this reason, the LIVING INNOVATION LAB initiates open calls for experiment proposals to expand and strengthen the transfer of technical capabilities and making innovative solutions, platforms, and data available for experimentation.

YOUR PARTNER: ACCELERATING INNOVATION WITH VIRTUAL VEHICLE

The Virtual Vehicle Research GmbH is Europe’s largest R&D center for virtual vehicle technology with 300 employees. Research priority is in supporting the virtual vehicle development process, which leads to a powerful HW-SW whole system design and automation of testing and validation procedures. This focus on industry related research makes VIRTUAL VEHICLE the innovation catalyst for future vehicle technologies.

WHO CAN APPLY?

If you are...

- developing smart, innovative concepts in digital future technologies,
- bridging the physical and virtual worlds with advanced approaches and industrialized solutions,
- interested in experiments in cooperation with VIRTUAL VEHICLE to speed up development,
- wishing to access VIRTUAL VEHICLEs many years of experience in interdisciplinary and virtual system development

...then do not miss this opportunity and apply to one of the open calls to realize your innovative approach!

Do you prefer first a quick experimental study?

If you first want to try out your ideas at VIRTUAL VEHICLE quickly, we offer Start-ups and SMEs our free, light touch “**Seed Action**”: a first try-out of potential solutions with the support of VIRTUAL VEHICLE’s expertise.