Panel Discussion

Panelists: Francesco Casella, Robert Hällqvist, Dirk Zimmer, Lars Eriksson

Q1) What exciting new features or developments are in the pipeline for OpenModelica, and where should we focus our efforts?

- Increasing adoption among industry users is a key priority.
- Improving FMI export remains a major focus area.
- Enhancing the graphical interface for OMSimulator to improve usability.
- Developing robust and simplified libraries (potentially aligned with a "Modelica Lite" standard) to support academic usage.
- Implementing a **dummy vs. expert mode** in OMEdit to help newcomers get started without overwhelming them with complex or conflicting settings.
- The OpenModelica package manager for libraries is working very well.

Q2) What are the main challenges facing OpenModelica in the coming years?

- Handling **large-scale systems**, including improved support for arrays and multi-rate simulation.
- Expanding **dynamic visualization** capabilities (though Francesco noted that the functionality already exists).
- **Improving robustness** - ensuring both the tool and simulations are stable and reliable.
- Providing **better error messages** to aid debugging and usability.
- Maintaining a **clear focus** on what OpenModelica should support - and what it should not.
- Enhancing **GPU support** to improve simulation performance for large-scale models.
- Evolving the **Modelica language** to become simpler; exploring approaches like **Modelica Lite** or other alternatives.
- Addressing key improvements, including:
    - GPU support
    - Array handling
    - Simulation robustness
    - More informative error messages

    - Refining models and libraries to reduce the burden on simulation tools to stabilize poorly defined models.
- OSMC structure: additional hiring may be necessary in the near future.

Q3) What key trends in simulation and modeling should OpenModelica focus on?

- **System of systems** modeling and simulation.
- **Data-driven models**, such as **Physics-Enhanced Neural ODEs**, integrating machine learning with physics-based simulation.
- **Low-hanging opportunities** for improvement, including:
    - Enhancing support for **external objects**.
    - Expanding support of **media libraries**.
    - Developing **educational resources**, including course materials and **tool-neutral** learning content (?)

Q4) What is OpenModelica's role in comparison to its competitors?

- **Promoting the Modelica standard** and fostering its adoption.
- Serving as a **reference implementation** of the standard - although full compliance may be challenging due to the complexity of the specification.
- Acting as a **playground for experimentation**, enabling innovations such as the implementation of multi-rate solvers.
- Providing an **accessible entry point** to Modelica, ensuring that newcomers find it easy to get started with the language.