Scientific Visualization encompasses the processes of exploring, transforming, and viewing scientific data as images, in order to get a better insight into the data.

Computational Steering (CS) strives to merge the data generation and visualization stages in a single process where the user can interactively control the simulation phase as well as the processing, exploration, and analysis phase. Steering systems aim ultimately to be general-purpose environments for specification and parameter control for both the simulation and the visualization stages.

Simulation Libraries provide computational tools for various application domains. A generic CS environment should easily integrate such libraries and provide inter-library data communication transparently.

We have designed an Object-Oriented Scientific Visualization and Computational Steering Environment which extends the concepts and power of systems as AVS/Express, Explorer, or Khoros with object-oriented concepts present in systems like Orange, vtk, or Open Inventor. We address all the requirements of a generic steering tool:

- **Extensibility:** easy integration of user-written C++ libraries
- **Interactivity:** GUI widgets for all simulation/visualization stages are automatically constructed
- **Dataflow:** simulations are visually specified as a module network driven by an extended OO dataflow manager. Loops can be created to naturally describe iterative processes.
- **Command:** the system interprets C++ code interactively
- **Persistence:** networks are saved as pure C++ source code so inter-system simulation transport is easy.

**System Architecture:**

- **OO Foundation:** C++ compiler interpreter merge
- **OO Dataflow:** the metaclass concept, enhances C++ with dataflow semantics.