**Abstract**

As HPC simulations grow more complex, debugging and optimizing them become vastly more difficult. This makes it necessary to design visualization tools that help developers understand the behavior of their applications. We propose novel visualizations and effective mechanisms to interact with them to support developer efforts to easily and efficiently analyze the behavior of their applications.

**Problems**

- The large size debug logs makes them difficult to understand. This makes it necessary to structure logs at a high level and provide developers the ability to focus on the regions that are most relevant to their tasks. **Propose hierarchical graph with zooming, expand/collapse interactions**

**Solution**

- Multidimensional visualizations to easily analyze complex program behaviors.

**Evaluation – User Study** (25 people, 3 experiments): CCPs/Snowflake improves the identification correlation in data with higher accuracy and faster speed than SCP, PCP.

**Conclusion**

The Interactive Flow Graph visualizes program behaviors efficiently by optimal visual encoding, graph algorithm and interactions. This visualization can be applied for large scale program to enable developers to easily analyze complex program behaviors.

**Multi-Dimensional Visualization**

- Propose Correlation Coordinate Plot (CCP)/Snowflake Visualization.

**Acknowledgements**

This material is based upon work supported by the U.S. Department of Energy, Office of Science, Office of Advanced Scientific Computing Research, and was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under contract DE-AC52-07NA27344 (LLNL-POST-658233).