

Visual Data Science

Advanced Cyberinfrastructure Systems



COMPaaS DLV, *COMposable Platform as a Service Instrument for Deep Learning & Visualization*, was purchased from Liquid, Inc., with NSF funds.

Its 4th-generation computer architecture, *composable infrastructure*, treats computer components – computer processing units (CPUs), graphical processing units (GPUs), networking, memory and storage – as pools of resources. It is:

- **Highly flexible.** Each application defines the resources it needs, and the operating system composes, or combines, resources on the fly.
- **Scalable.** As more infrastructure is added, it's auto-integrated with the existing infrastructure and becomes part of the pool of capacity.
- **High-throughput.** System components are interconnected with a high-speed internal fabric, enabling Big Data to quickly move among CPU, GPU, memory and storage at optimum speeds with little to no bottlenecks.

NSF award #CNS-1828265.

<https://compaas.evl.uic.edu/>

Broader Impacts

- UIC faculty has unique computing requirements for data-science research that investigates and contributes to solutions for societal issues in such areas as anthropology, biology, cybersecurity, data literacy, fraud detection, healthcare, manufacturing, urban sustainability, and cyber-physical systems (e.g., autonomous vehicles).
- Access to COMPaaS DLV will enable faculty researchers, students and postdocs to execute deep learning and visualization codes faster, apply more sophisticated models to large-scale problems, gain greater insights, accelerate discovery, and open new avenues of research.
- By enabling researchers to scale their codes, COMPaaS DLV serves as an “on ramp” to large-scale NSF and DOE facilities.
- COMPaaS DLV will enable UIC to recruit new faculty and graduate students who are attracted to institutions that can support their computational needs.
- Liquid designs its systems from a data center perspective, though EVL sees value in using it for science and engineering research and education. Liquid is excited to work with EVL to configure COMPaaS DLV in new and novel ways in order to learn more about this new market for its products.



Maxine D. Brown, EVL Director

Luc Renambot, Associate Research Professor

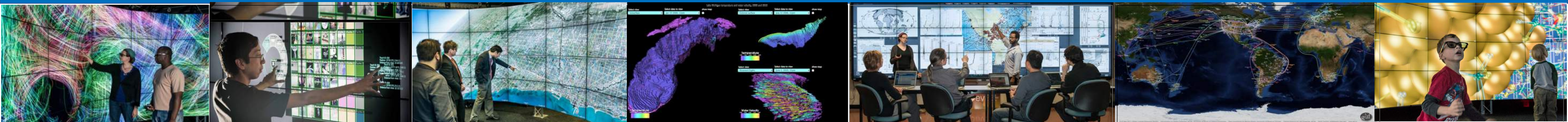
Andrew E. Johnson, Professor and EVL Director of Research

Lance Long, Senior Research Programmer
Computer Science



Visual Data Science

Advanced Cyberinfrastructure Systems

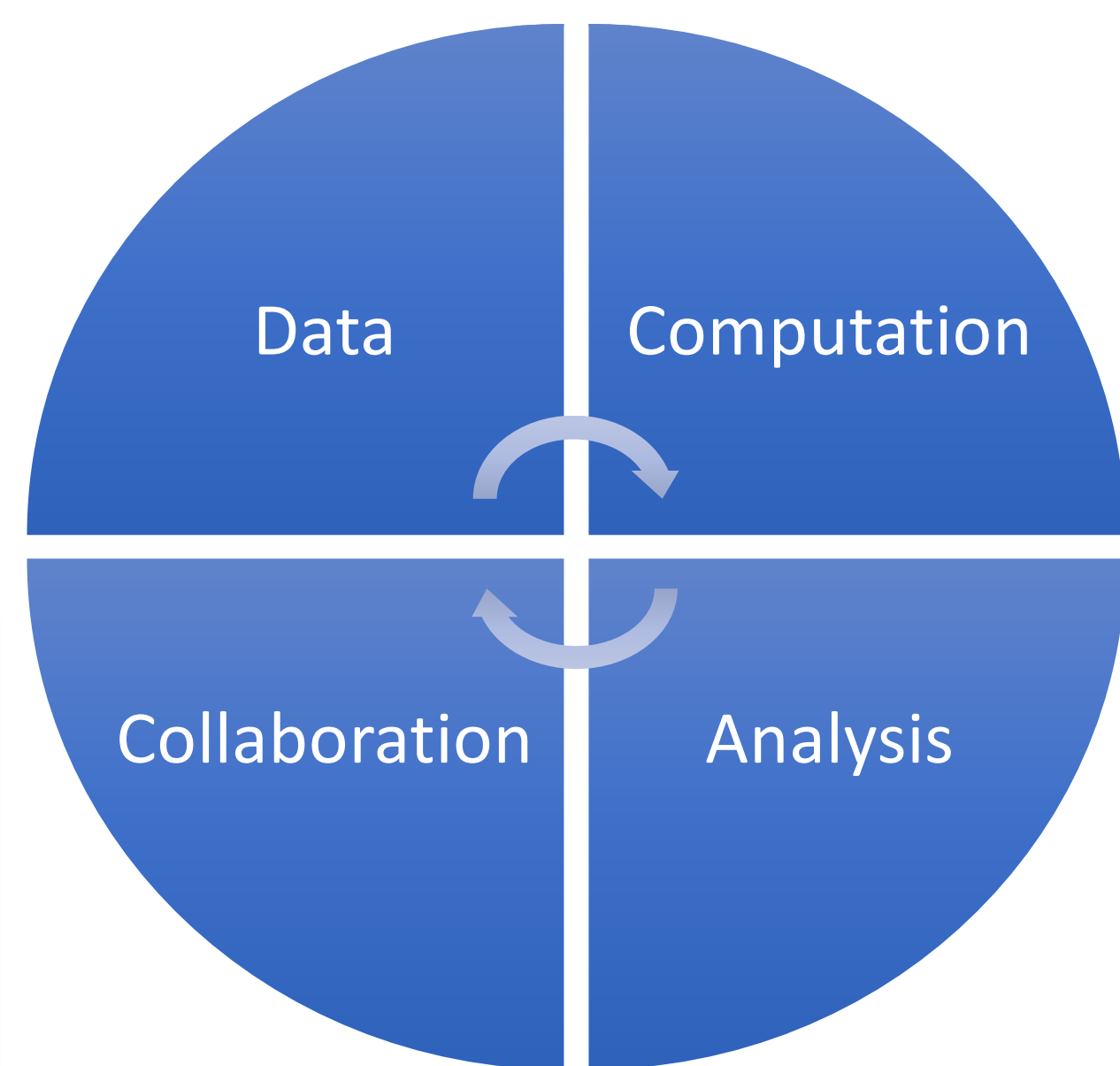


Cyberinfrastructure/Data

- Networking
- Data Storage
- Visualization
- Computing

Collaboration

- SAGE2 Group Environment
- JupyterLab – SAGE2
- Data Transfer Nodes
- Docker Registry



Computing

- GPU Nodes for Machine Learning/Deep Learning
- OpenStack
- Kubernetes/Docker
- Optane Memory

Visual Analysis

- Visualization
- Virtual Reality
- Augmented Reality
- Attentive Environments

EVL is a **technology enabler** focused on high-performance computing, data, visualization and networking cyberinfrastructure. Most recently:

- **COMPaaS DLV**, *COMposable Platform as a Service Instrument for Deep Learning & Visualization*, is a GPU system for UIC research and research training, connected via UIC's 100 Gbps network to the global research community. NSF award #CNS-1828265. <https://compaas.evl.uic.edu/>
- **SAGE2™**, *Scalable Amplified Group Environment*, is an open-source, web-based, user-centered platform for distributed collaboration. NSF award #ACI-144196 to Univ. of Hawaii at Manoa and EVL. <http://sage2.sagecommons.org/>
- **Continuum** is EVL's attentive classroom that unifies collaboration workspaces and ambient sensors to dynamically and intuitively enhance collaborative sessions. NSF award #CNS-1625941. <https://www.evl.uic.edu/continuum>
- **Visualization, Virtual Reality, Augmented Reality.** EVL develops visualization, virtual-reality and visual analytics applications, applying user-centered design and interaction techniques. EVL is well known for inventing the CAVE™ Automatic Virtual Environment in 1992 and the CAVE2™ Hybrid Reality Environment in 2012. NSF award #CNS-0959053. <https://www.evl.uic.edu/>

CAVE, CAVE2 and SAGE2 are trademarks of the University of Illinois Board of Trustees.

Intellectual Merit

- EVL researches, acquires, develops, deploys, tech transfers, and commercializes advanced technologies for campus, regional, national and international partners in academia, government laboratories, industry and non-profits. EVL provides support and training to help transform how its partners manage their data, gain insight and knowledge, and maintain a competitive edge in today's global marketplace.



Maxine D. Brown, EVL Director
 Luc Renambot, Associate Research Professor
 Andrew E. Johnson, Professor and EVL Director of Research
 Lance Long, Senior Research Programmer
 Computer Science

