



List of Previously Funded Platforms

ArcticConnect - arcticconnect.org (PI: Maribeth Murray - murraym@ucalgary.ca)

Originally created to support research in the Arctic, ArcticConnect has a number of features that would be useful for many types of research. These features include:

- A web mapping tool that allows researchers to customize map projections for scientifically accurate visualization and analysis
- A tool that enables researchers, educators, interested private sector entities, government agencies, and the general public to access and share data and information contained in assorted formats including publications, grey literature, research licenses, photo archives, field notes, and project metadata
- A tool that enables research stations to connect their sensors - including those that provide near-real time data - to a cloud service for visualization, information sharing, and collaborative analysis
- A mobile app (currently undergoing final testing) that allows researchers and citizen scientists to contribute observations on animal species for the purpose of biodiversity monitoring, assessment, research, management and education

CloudUAV – clouduav.ca (PI: Greg McDermid - mcdermid@ucalgary.ca)

CloudUAV is targeted at Canadian researchers using Unmanned Aerial Vehicles (UAVs, aka drones) for data collection, and supports research in any discipline where a UAV is required. CloudUAV provides several services to simplify the use of UAVs in research, including:

- UAV project management
- Transport Canada regulatory compliance
- Mission planning
- A mobile app to log UAV field missions
- Equipment management

Post mission, CloudUAV simplifies collaboration by providing document storage, media management (flight imagery, flight logs, maps, visualization point clouds), and secure sharing of all project-related information.

PAVICS - <https://www.ouranos.ca/en/program/scenarios-services-climatiques> (PI: Diane Chaumont - Chaumont.Diane@ouranos.ca)

PAVICS is a platform that streamlines climate scientist workflows. Running on networked supercomputers, this platform relieves individual scientists of the burden of fetching and archiving multi-terabyte sized datasets and provides parallel computation tools to analyze and visualize large volumes of climate data. Along with climate modelers and analysts, potential users of PAVICS may include researchers in other disciplines who need access to climate data and/or services. These disciplines include, but are not limited to:

- Agriculture, commercial fisheries and aquaculture



- Ecosystems and biodiversity
- Energy management
- Forestry management
- Health and climate change
- Maritime and northern environments
- Water management
- Civil engineering

3D Slicer / SlicerIGT – slicer.org (PI: Gabor Fichtinger - fichting@queensu.ca)

A truly international collaborative effort with more than 330,000 downloads, 3D Slicer is an open-source software platform for medical image informatics, image processing, and three-dimensional visualization. Built over two decades through support from the National Institutes of Health and a worldwide developer community, Slicer brings free, powerful cross-platform processing tools to non-clinical physicians, researchers, and the general public. 3D Slicer is similar to a radiology workstation, supporting delineation of organs and spatial registration of series of images like CT and MRI, with thousands of features and nuances. It is not tied to specific hardware and runs equally well on Windows, MacOS and Linux.

A significant application of medical image analysis and visualization is image-guided therapy (IGT). IGT is a common name for a field spanning all image-assisted medical interventions, such as surgeries, radiation therapy, and needle-based injections. While 3D Slicer is helpful in planning IGT procedures, it offers virtually no support to the actual delivery of the therapy. Under CANARIE's Call 2a, researchers at Queen's University addressed this need by extending the functionality of Slicer to create SlicerIGT.

iEnvironment (PI: Don Cowan - dcowan@csg.uwaterloo.ca)

iEnvironment is a distributed data management platform and user gateway for integrated environmental monitoring and modelling of surface water. This sustainable, collaborative research data platform enables researchers from multiple disciplines to collaborate and easily discover access, combine and reuse data and models from multiple sources to perform novel forms of analyses.

iEnvironment is used by researchers in a number of disciplines where surface water is a concern, including:

- Water Sciences and Engineering
- Environment Engineering
- Civil Engineering
- Hydrology
- Biology
- Ecology
- Forestry
- Natural Resources

**GenAP – GenAP.ca (PI: Guillaume Bourque - guil.bourque@mcgill.ca)**

The GenAP Platform facilitates rapid sharing of genetics and genomics data and enables the implementation of advanced analysis tools for life science researchers on a national level. Built on virtual machines (VMs) and modular services, GenAP is designed to be reusable by other groups that provide HPC services to genetic and genomic researchers.

The main benefit of GenAP is that it reduces the computational complexity of processing high-throughput data sets, and empowers the large life science community, who are not necessarily HPC experts, to explore their data in new ways. Features provided by GenAP include:

- Support for CVMFS and Squid caching, to enable installation of frequently requested software packages
- A virtual machine image containing a fully installed UCSC Genome Browser
- Access to private research web services
- A pre-configured Galaxy server

VESTA – vesta.crim.ca (PI: Andre Lapointe - andre.lapointe@crim.ca)

VESTA is a timeline-based annotation platform for multimedia content. It offers an integrated set of innovative software for analyzing and annotating audio and video recordings. These tools allow researchers to significantly accelerate, and in some cases, automate the analysis and annotation of recordings.

As a web-based collaborative platform, analysis and annotations can be shared among other researchers, increasing collaboration and opening the door to larger-scale multi-partner studies. VESTA results in considerable gains in productivity by significantly reducing analysis time and improving consistency.

Tools offered in the VESTA platform include:

- Speaker segmentation: Partition an audio frame into segments according to the identity of the person speaking. This service provides the capability to determine at which times each person is speaking and the gender of each speaker.
- Speech-to-text: Transcribe the speech of an audio frame. A domain-specific vocabulary can be provided to improve results.
- Text-audio matching: Provide correspondence between a given text and an audio frame. This service returns the start and end positions of each segment found in the two mediums.
- Video shot transition detection: Find the temporal positions of the visual transitions between the shots in a video.
- Face pose analysis: Identifies the face poses in a video and their orientation (pose in front view, profile, or other).

**PACTE – pacte.crim.ca (PI: Andre Lapointe - andre.lapointe@crim.ca)**

PACTE is a collaborative text annotation platform that integrates a range of practical tools for research groups. It offers three annotation modes: manual, semi-automatic and automatic.

- Manual annotation is carried out through an interface optimized for rapid entry of the data enriching a text.
- Automatic mode is composed of specialized and configurable annotation services (named entities, disambiguated terminology, etc.).
- Semi-automatic annotation, using active learning algorithms, allows training of a prediction model with minimal annotation, requiring less effort to annotate text corpora.

The collaborative nature of the PACTE platform allows sharing of analyses and annotations with other researchers, thereby facilitating cooperation and opening the door to large-scale multi-partner studies. PACTE generates important gains in productivity by significantly reducing the time spent on analysis, while improving consistency.

SensorThings – sensorup.com (PI: Steve Liang - steve.liang@sensorup.com)

SensorThings Cloud is a sensor data and device management API that is sensor agnostic and based on the Open Geospatial Consortium (OGC) standards. SensorThings Cloud makes information from all different kinds of sensors accessible and query-able in a single platform, and is able to manage a very large number of real-time sensor data streams. The architecture allows for integration of Internet of Things (IoT) applications with existing GIS and GeoWeb infrastructure. Research areas supported by SensorThings Cloud to date include:

- Emergency and disaster management
- Building energy consumption monitoring and management
- Arctic monitoring
- Groundwater monitoring
- Air quality monitoring
- Vehicle and object tracking
- Smart cities

Motus – motus.org (PI: Denis Lepage - dlepage@bsc-eoc.org)

The Motus Wildlife Tracking System is a collaborative research network that uses coordinated and automated radio telemetry arrays to study movements of small migratory animals. Motus is a program of Bird Studies Canada, in partnership with Acadia University and collaborating researchers and organizations.

Motus tracks animals (birds, bats, and large insects) affixed with digitally encoded radio transmitters that broadcast signals several times each minute. These signals are detected by automated receiving stations that scan for signals 24 hours a day, 7 days a week, 365 days a year. When results from many stations are combined, the array can track animals at multiple scales and across a diversity of landscapes covering thousands of kilometers.

**CANFAR – canfar.net (PI: JJ Kavelaars - jj.kavelaars@canada.ca)**

The Canadian Advanced Network for Astronomy Research (CANFAR) is a university consortia that operates a national platform for data-intensive scientific computing.

CANFAR services include:

- Archival data storage for major Canadian and international observatories and projects
- Cloud processing
- User-managed storage for research teams
- User-managed, team-based access control
- Infrastructure for analytics on massive datasets
- Innovative development to keep Canadian science at the leading edge

The Canadian Writing Research Collaboratory – cwrc.ca – (PI: Susan Brown - sbrown@uoguelph.ca)

The Canadian Writing Research Collaboratory (CWRC) provides a web-based research environment in which scholars can engage in online scholarship either individually or in groups. The platform supports best practices in the production of online collections, editions, born-digital essays, anthologies, collections, monographs, articles, or encyclopedia entries, or bibliographies, and supports the inclusion of visual, audio, and video sources. Central tools enable document encoding using the Text Encoding Initiatives, as well as annotation of texts using the Resource Description Framework, the language of the semantic web. It supports collaboration through the use of interoperable data formats and interlinking of materials, and for teams provides tools for communicating, tracking activity, and workflow.

HEPNet - <http://heprc.phys.uvic.ca> (PI: Randall Sobie - rsobie@uvic.ca)

Originally designed to support researchers at the ATLAS high energy physics (HEP) experiment at the CERN Laboratory in Geneva, HEPNet provides a number of tools that would benefit any researchers who needs to run data-intensive applications in cloud or high performance computing environments. These tools include:

- A compute job scheduler, ideal for dynamic cloud environments
- A virtual machine management service that starts and stops VMs based on the needs of compute jobs currently queued
- A virtual machine image repository manager with support for multiple cloud types
- A CVMFS software repository
- A Shoal service used to dynamically provision web caches to Virtual Machine in a distributed cloud environment.
- A federated storage system that can make use of distributed storage resources

Montage – University of British Columbia (PI: Sohrab Shah – sshah@bccrc.ca)



The Montage platform was developed to support the field of single cell cancer genomics. Extraordinary progress in measurement technologies has made it possible to reliably and accurately sequence the genomes of individual cancer cells at scale. Montage provides three primary services to researchers.

- The Laboratory Information Management System (LIMS) component handles the data management function of Montage and facilitates storing and indexing of information on patients (anonymized), tumour samples, experimental protocols, experimenter, dates, times and status of particular experiments.
- The Kronos analysis tool facilitates automating the development and execution of reproducible, modular, auditable and distributable bioinformatics workflows.
- E-scape is a set of visualization tools that provide a web browser-based visualization environment to render complex relationships between cancer evolution data representations in an intuitive, interactive framework.