Matt Link
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Director, Systems
Research Technologies, Pervasive Technology Institute
Office of the Vice President for IT, Indiana University

Supported by the National Science Foundation
• Developed by the University at Buffalo Center for Computational Research
• Comprehensive resource management for HPC systems
• Provide detailed operational and usage data
• Support optimization of HPC resource utilization
• Facilitate planning and analysis
• Used for XSEDE metrics
• NSF eager award to Indiana University and University at Buffalo

• Collaboration between the Center for Computational Research at the University at Buffalo, and the Pervasive Technology Institute and Center for Network Science at Indiana University

XDMoD – Value Analytics

• Enables academic institutions to better understand Return On Investment (ROI) on advanced Cyberinfrastructure (CI)

• Shows the value of:
  o Fostering collaboration
  o Supporting scientific publications
  o Show relationship between campus CI and external grant funding

• Local XDMoD installation required – all data kept locally²
User Interface
VA module will be integrated into local version.
Grant data
"Since Big Red’s installation in 2006, users of that system were PIs or project directors on a total of $253 million in external funding, which includes $65.4M in facilities and administration funds. In addition to the research dollars flowing into the University, the ability to leverage IU’s leadership in research cyberinfrastructure has aided many other grants awarded to IU.”

–2010
Screen shots of PTI developed statistics tool.

PTI: Funding analytics

RT Stats

Biochemistry/Molecular Biology (Indianapolis)
School Of Medicine

<table>
<thead>
<tr>
<th>Biochem Auxiliary Services</th>
<th>Bioinformatics</th>
<th>Biochemical Genomics Program</th>
<th>Diabetes Basic Science Res Ctr</th>
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<tr>
<td>Abdul Sater, Zahi A</td>
<td>Arthur, Jack W</td>
<td>Cerabona, Donna</td>
<td>Conteh, Abbas</td>
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<td>Craven, Kelly</td>
<td>Edenberg, Howard J</td>
<td>Folck, Anthony F</td>
<td>Fox, Melanie J</td>
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<td>Fusakio, Michael</td>
<td>Gendron, Jaimie M</td>
<td>Georgiadis, Millie M</td>
<td>Heyen, Joshua W</td>
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<td>Heyerdahl, Darcy</td>
<td>Hoang, Quyen Q</td>
<td>Huang, Fei</td>
<td>Hunter, Gerald Q</td>
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Grants
24 totaling $6,056,352.00

<table>
<thead>
<tr>
<th>Grant</th>
<th>Project</th>
<th>Status</th>
<th>Dates</th>
<th>Award Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>043956-000058</td>
<td>Docking uPAR for Selective Targeting of Cancer Metastasis</td>
<td>New</td>
<td>January 2015 – June 2016</td>
<td>$180,000.00</td>
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<td>044265-000048</td>
<td>The Bipolar Genome Study</td>
<td>New</td>
<td>May 2014 – April 2016</td>
<td>$87,728.00</td>
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<td>053198-000148</td>
<td>Collaborative Study on the Genetics of Alcoholism (COGA)</td>
<td>New</td>
<td>September 2015 – August 2016</td>
<td>$1,480,906.00</td>
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<td>054541-000058</td>
<td>Regulation of RNA Polymerase II Transcription by the Phosphatase Rtr1</td>
<td>New</td>
<td>August 2015 – July 2016</td>
<td>$291,461.00</td>
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<td>054541-000078</td>
<td>Regulation of RNA Polymerase II transcription by the phosphatase Rtr1</td>
<td>New</td>
<td>August 2015 – July 2016</td>
<td>$314,710.00</td>
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<td>055553-000060</td>
<td>Non-Homologous End Joining Repair in Human</td>
<td>New</td>
<td>April 2015 – March 2016</td>
<td>$339,550.00</td>
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<td>055664-000058</td>
<td>Metabolic stress responses and eIF2 kinase GCN2</td>
<td>New</td>
<td>May 2014 – April 2016</td>
<td>$134,929.00</td>
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<td>056664-000088</td>
<td>Metabolic stress responses and eIF2 kinase GCN2</td>
<td>New</td>
<td>May 2014 – May 2016</td>
<td>$116,099.00</td>
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<td>057512-000068</td>
<td>Early binge drinking and gene regulation</td>
<td>New</td>
<td>September 2015 – August 2016</td>
<td>$225,424.00</td>
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</tbody>
</table>
2016 IU grant income
$614M

- CI users: $466M (76%)
- Non-CI users: $148M (24%)
Current

• IU KFS export -> JSON convert -> XDMoD_VA ingest

• NIH and NSF from public datasets
  o IU to provide scripts for NIH and NSF data imports to local³ XDMoD_VA instance

Grant data capabilities

Future

• Ability to group by organizational structure(as seen in PTI slide) (IMS export)
Grant dollars per PI (based on timeline selected)
Future capability (grouped by organizational structure)
Roles and funding
Grant roles and funding agency

Full XDMoD integration (job data and VA data) if available from your institution
Prorated active grant dollars

Ability to drill down to individual grants
Combined HPC job statistics and value analytics metrics

CPU Hours - Grant Dollars

- Jobs: [CPU Hours: Total]
- Value Analytics Grants: [Time-Proportional Dollars of Active Grants ($)]
Grant size and duration

Grants over time associated with funding agencies
Publication data
Current
• Working to develop XDMoD schema for ingest
• Access to NIH grant and publication data available
  o NIH Exporter (https://exporter.nih.gov/)
  o Limited visualization capabilities

Publication data capabilities

Future
• Roadmap to link publication and grant data
• Ability to group by organizational structure
• Visualization capabilities integrated
Co-authorship network
**Roadmap**

**February 2017**

- Pre-beta testing under way
- Grant and PI information available in XDMoD.

**Spring 2017**

- Beta tester signup
  - Publication data available.
  - Aggregation charts available.

**June 2017**

- Cross-referencing grants and HPC usage data

**July 2017**

- Beta release

**October 2017**

- Final release

Email xdmodva@indiana.edu to participate.
- Install and maintain Open XDMoD local instance
- Ability to ingest job logs from computational systems

**Beta program requirements**
- Ability to get your grant data from your Office of Research Administration
  - We will help you write a script to convert your data to JSON format for ingestion
- Engagement from your institution (you, ORA)
- Rice and SDSC are our two beta testers so far
- Several institutions expressed interest – we’ll be in touch
Thank you. Questions?

Contact: xdmovda@indiana.edu
• Please cite as: “XDMoD Value Analytics Module”

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