1st Annual
Commonwealth Computational Summit

Organized by the Center for Computational Sciences
https://www.ccs.uky.edu/ccs_square/

Academia and Industry from across the Commonwealth coming together to explore Big Data, High Performance Computing and Future Technologies!

October 17, 2017
University of Kentucky
W. T. Young Library Auditorium
401 Hilltop Avenue
Lexington, Ky 40506

Tony Elam - Introduction

Tony Elam – Associate Director, Center for Computational Sciences

Director, Strategic Initiatives, College of Engineering

Affiliation(s):
 UKy: IBI, MCC, ITS
 IEEE- Consultants Network
 Lex Commerce - SPARK/Entrepreneurship

Interests/Specialties:
 Systems Engineering/Complex Systems
 Project Management
 Serious Games

BIG Thank You to ALL of Our Sponsors!

Microsoft

DELL EMC

MATRIX INTEGRATION

UK Institute for Biomedical Informatics

U.K COMPUTER SCIENCE

UK Center for Computational Sciences

KSTC KENTUCKY SCIENCE & TECHNOLOGY CORPORATION

IBM

SPECTRA

Google

NVIDIA

NATIONAL INSTRUMENTS

UK College of Engineering

UK College of Arts and Sciences

UNIVERSITY OF LOUISVILLE
J.B. SPEED SCHOOL OF ENGINEERING

Agenda Morning

Time	Topic	Location
8:30-9:00AM	Registration – Breakfast	WT Young Library Atrium
9:00-9:15AM	Welcome and Introductions - Tony Elam, Lisa Cassis, Jim Griffioen	WT Young Library Auditorium
9:15-10:00AM	Academic Keynote – Pascal Hitzler	Auditorium
10:00-10:30AM	Poster Session Lightning Introductions	Auditorium
10:30-11:00AM	Breakout Parallel Sessions - Big Data – GQ Zhang - Big Computing – Peter Kekenes-Huskey - Future Technologies – Cody Bumgardner	Auditorium Mining Bldg 102 Library Gallery 1-65
11:00-11:15AM	Break	
11:15-12:15	Parallel Sessions Continue	Same Locations
12:15PM	Lunch Served – BBQ Buffet	Boone Center

Agenda Afternoon

Time	Topic	Location
12:45-2:15PM	Student Poster Session/Competition	Boone Center
2:30-3:15PM	Government Keynote Speaker - Chaitanya Baru, NSF	WT Young Library Auditorium
3:15-4:00PM	Industry Keynote Speaker - Jeffrey Kirk, Dell EMC/HPC	Auditorium
4:00-4:30PM	Poster Competition Winners, Closing	Auditorium
4:30-5:30PM	Reception/Networking (Cash Bar)	Boone Center

NOTE: Post-Summit we will make available online
– **Speaker Slides and a Participant List**

Lisa Cassis - Welcome

Lisa Cassis – Vice President of Research
 Professor of Pharmacology and Nutritional Sciences
 Co-Director, Division of Nutritional Sciences
 Graduate Faculty in Nutritional Sciences
 Cardiovascular Research Center
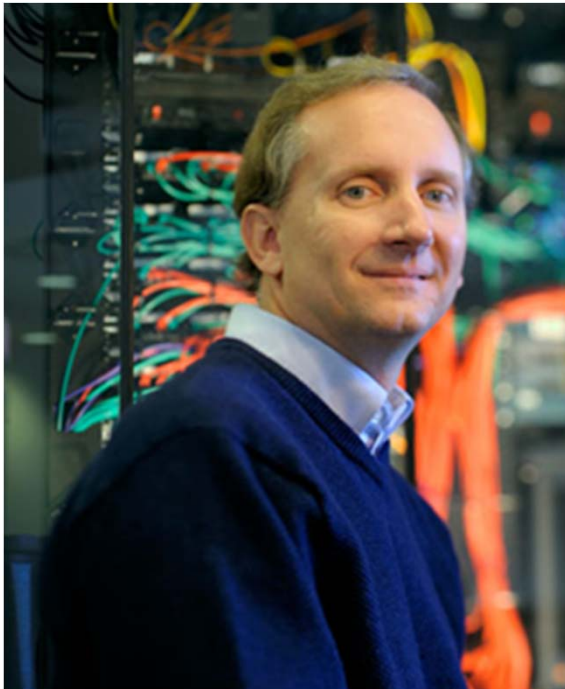 MD/PhD Program Mentor

Affiliation(s):
 Pharmacology & Nutritional Sciences
 Cardiovascular Research Center

Interests/Specialties:
 Obesity
 Diabetes
 Cardiovascular

James Griffioen
Welcome and What's New

James Griffioen – Director, Center for Computational Sciences
Professor of Computer Science
Director, Lab for Advanced Networking

Affiliation(s):
Department of Computer Science
Center for Computational Sciences

Interests/Specialties:
Distributed Systems
Network Protocols
Software Defined Networks

DLX3

- Upgrading 256 Node DLX2 System
  - New Hardware
    - Management Nodes (Administration/Login)
    - GPFS Disk Storage (1.3 PB)
    - 20 Additional Compute Nodes
  - New Software
    - Latest OS & rocks/roll s/w
    - Newly compiled common s/w packages & libraries
    - Singularity virtualization support
    - XDMoD monitoring system
  - Total ~ 180 Teraflops

Ky Research Informatics Cloud (KyRIC) Coming Online Soon!

- NSF MRI Grant – Focused on Big Data Analytics

- 50+ Large Memory Servers
  - Each Quad Processor/10 Core each – 40 Cores
  - Each – 3 TB memory and 6 TB SSD
  - Interconnect – 100Gbps Ethernet

- High-speed object/file storage system

- Approx. 128 teraflops

OpenStack, GPUs & More…

- ## Object Storage – 1.4 PB mirrored system
  - Presents an object abstraction, exceptional I/O throughput rates

- ## OpenStack VM system (supporting thousands of VMs)
  - 3 controller/network nodes
  - 8 compute nodes, each w/ 40 VCPUs/20 cores, 512 GB RAM

- ## GPU Facility
  - Alienware machine (2 NVIDIA 1080)
  - Digital Storm Aventum machine (4 NVIDIA Titan X/Pascal)
  - Dell Server w/ 2 Intel PHI co-processors (Knights Corner)
  - Eval Intel PHI node (Knights Landing)
  - IBM Minsky w/ 2 NIVIDIA P100's and Nvlink
  - Two new Dell servers each with 4 NVIDIA P100s

Pascal Hitzler

Title: A Brief Introduction to Semantic Web - and a Contribution to Explainable Artificial Intelligence

- **Endowed NCR Distinguished Professor of Computer Science and Engineering at Wright State University**

- Director of Data Science

- Over 350 publications in such diverse areas as semantic web, neural-symbolic integration, knowledge representation and reasoning, machine learning, denotational semantics, and set-theoretic topology

- Editor-in-chief of the Semantic Web journal by IOS Press and of the IOS Press book series Studies on the Semantic Web

- Co-author of the W3C Recommendation OWL 2 Primer, and of the book Foundations of Semantic Web Technologies by CRC Press

- Editorial board of several journals and book series and is a founding steering committee member of the Web Reasoning and Rule Systems conference series, of the Neural-Symbolic Learning and Reasoning workshop series, and of the Association for Ontology Design and Patterns

Chaitan Baru

Title: Harnessing Data for 21st Century Science and Engineering

- **Senior Advisor for Data Science in the Computer and Information Science and Engineering Directorate at the US National Science Foundation**

- Co-chairs the NSF working group on Harnessing the Data Revolution Big Idea

- Advisor to the NSF Big Data Regional Innovation Hubs and Spokes program (BD Hubs/Spokes)

- Manages the cross-Foundation NSF BIGDATA program

- Co-chairs the Big Data Inter-agency Working Group of the Networking and IT R&D program (NITRD) of the White House Office of Science and Technology Policy

- Co-authors of the Federal Big Data R&D Strategic Plan

- Associate Director for Data Initiatives San Diego Supercomputer Center, University of California San Diego

- BTech in Electronics Engineering from IIT Madras and an M.E. and PhD in Electrical Engineering from the University of Florida

Jeffrey Kirk

Title: HPC and AI - Perfect Partners for Leading-edge Discovery and Innovation

- **Senior Principal Engineer, Dell EMC, Office of the CTO - HPC and AI Technology Strategist**
- Leading AI strategy development for Dell EMC, and working on new AI solutions
- Prior to joining Dell EMC:
  - AMD - specialized in superscalar RISC and x86 platforms for high performance computation (1999)
  - Mellanox - worked on some of the first Infiniband HPC installations and supported Dr. D.K. Panda and the first implementation of MVAPICH at his alma mater, The Ohio State University
  - Solarflare - focus was OnLoad technology and financial markets
  - Dell Networking – implement their first Fibre Channel over Ethernet systems (holds several patents on FCoE)