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CURRICULUM VITAE

V. K. Cody Bumgardner, PhD
Assistant Professor, Clinical Title Series
Department of Pathology & Laboratory Medicine
University of Kentucky College of Medicine
UK HealthCare

I. GENERAL INFORMATION

Office Address 800 Rose St, MS 116A
 Lexington, KY 40536

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II. EDUCATION

Undergraduate

Morehead State University
 Lexington, KY
05/1995-05/1996 Pre-Engineering
 University of Kentucky
 Lexington, KY
08/1996-05/1999 Philosophy
05/2003-05/2009 BS, Computer Engineering

Professional/Graduate

University of Kentucky
 Lexington, KY
05/2010-05/2017 PhD in Computer Science

III. PROFESSIONAL EXPERIENCES

Rowan County Board of Education
 Morehead, KY
05/1994-05/1996 Network Consultant, IT, part-time

Morehead State University
 Morehead, KY
05/1995-12/1995 Consultant, IT, part-time
01/1996-08/1996 Physics Co-Op, Mathematics and Physics, part-time

Pomeroy Computer Resources
Lexington, KY
08/1996-12/1997 Systems Consultant, Systems Support, full-time

Communitronics Inc.
Lexington, KY
01/1997-02/2000 Senior Network Engineer/Security Analyst, Systems Engineering, full-time

Nuvox Communications
Lexington, KY
05/2000-09/2001 Senior Technical Manager, Solutions Consulting, full-time

Netsource
Lexington, KY
09/2001-06/2002 Director of Technical Services, Technical Services, full-time

University of Kentucky
Lexington, KY
06/2002-11/2003 Lead Developer, Center for Minimally Invasive Surgery, full-time
11/2003-01/2008 Lead Systems Programmer, UKIT, full-time
01/2008-07/2010 Director Enterprise Computing and Development, UKIT, full-time
07/2010-07/2016 Chief Technology Architect, UKAT, full-time
07/2016-07/2017 Director of Research Computing, Research Computing, full-time
09/2017-present Assistant Professor, Computer Science, courtesy joint appointment

IV. HOSPITAL or CLINICAL APPOINTMENTS

University of Kentucky
Lexington, KY
Department of Pathology
Lexington, KY
08/2017-present Assistant Professor, Clinical Title Series, full-time

V. CONSULTING ACTIVITIES

State/Regional

Commonwealth Office of Technology
Frankfort, Kentucky
06/2014-09/2014 Cloud Migration Strategy and Procedures in Support of Executive Order 2012-880

VI. ADMINISTRATIVE ACTIVITIES & UNIVERSITY SERVICE

University

University of Kentucky
Lexington, Kentucky

Education & Research

08/2008-08/2012 Member, High Performance Computing Technical Advisory Committee
08/2012-08/2014 Chair, High Performance Computing Technical Advisory Committee

College

University of Kentucky
Lexington, Kentucky

Administration

08/2011-08/2013 Chair, UKAT Enterprise Technology Architecture Committee
08/2013-07/2015 Member, UKAT Enterprise Technology Architecture Committee

Education & Research

08/2014-present Member, Arts and Sciences Research/Scholarship Committee

VII. SPECIAL ASSIGNMENTS

A 20 year career comprised of strategic planning, technical, and leadership roles in the areas of technology architecture, software development, networking, research, systems, and security.

Skills:

1. **Strategic planning:** Lead efforts to reorganize infrastructure organization to align with future state cloud computing opportunities. I established a "virtual first - highly distributed" policy for resource acquisition and service delivery, transforming service delivery from a mode of single path failure to a model of high availability. Lead efforts to apply application profiles to computational and storage resources, which resulted in higher performance and lower cost, through assigning appropriate resources to projects based on strategic value.
2. **Leadership Development:** Completed CIO Pathways Leadership Development Program (2011). Graduated the UKIT Leadership Development Program (2010 and 2011). Student supervisor of Kentucky Student Technology and Leadership Program of Rowan County (1995). I have been fortunate to receive ongoing mentoring from highly respected individuals in their fields, in turn I mentor others and actively engage in professional development inside and outside of my organization.
3. **Applications:** Extensive experience in the design and deployment of highly redundant systems utilizing application load balancing, virtualization, and cloud services. Deep

understanding of all aspects of application development, testing, deployment, and monitoring.

4. Hardware: Experience ranging from hardware description (HDL and VHDL) through digital/analog circuits to analog power systems.
5. Network: Extensive experience in network design on the enterprise and carrier level. I have supported and implemented routers, switches, firewalls, content switches/load balancers, and VPN concentrators from most major vendors.
6. Development: Experience in languages and development practices ranging from machine specific assembly to high level languages.

VIII. HONORS & AWARDS

04/2016 Outstanding PhD Student in Computer Science, University of Kentucky
04/2016 Honorable Order of Kentucky Colonels, Kentucky Colonel

IX. PROFESSIONAL ACTIVITIES, PUBLIC SERVICE & PROFESSIONAL DEVELOPMENT

Memberships

05/2011-present Institute of Electrical and Electronics Engineers (IEEE)
05/2011-present Association for Computing Machinery (ACM)

Review Panels

06/2015-06/2015 **NSF Panel**
Panelist

04/2017-07/2017 **2017 International Conference on Advances in Computing, Communications and Informatics (ICACCI) Panel**
Technical Program Committee: Reviewer

Media Contributions

01/2012 **SC11**
Commoditization of Computational Systems, Video, Seattle, WA, SuperComputing (SC) 2011 Staff

06/2013 **Storage Switzerland, LLC**
Growth of Unstructured Data, Video, San Jose, CA, Crump, George

06/2013 **InfoQ**
OpenStack in Action Author Interview, Web, Sergio De Simone

X. SPEAKING ENGAGEMENTS

Local

- University of Kentucky Department of Computer Science**
Lexington, Kentucky
- 09/2011 Keeping Current Seminar: “Current Topics in Cloud Computing”
10/2012 Keeping Current Seminar: “Cloud Platform as a Service”
- Intel / Dell**
Lexington, Kentucky
- 10/2011 Converged Computing Conference: “Enabling Scientific Discovery”

State/Regional

- Educause**
Tampa Bay, Florida
- 05/2012 Southeast Regional Conference: “Transformation of Student Spaces”
- Commonwealth of Kentucky**
Lexington, Kentucky
- 05/2012 Kentucky CIO Meeting: “Building a Regional Resource Cloud”

National/International

- Dell Computer**
Orlando, Florida
- 06/2011 Dell Storage Forum: “Higher Education Computing”
- American Society of Agricultural and Biological Engineers**
Louisville, Kentucky
- 08/2011 International Meeting: “Growing Research Through Hybrid Cloud”
- International Conference for High Performance Computing**
Seattle, Washington
- 10/2011 SC11: “Research and Hybrid Cloud”
- Dell Computer**
Santa Cruz, California
- 04/2013 Dell XL: “Cloud Computing and Virtualization in SuperComputing”
- Dell Computer**
San Jose, California
- 06/2013 Dell Enterprise Forum: “Optimization of Clouds for the Enterprise”

- 08/2014 **Dell Computer**
Nashville, Tennessee
Global Summit: "Future of Information Technology"
- 06/2015 **International Workshop on Computer and Networking Experimental Research Using Testbeds**
Columbus, Ohio
Panel: "Software Defined Networks (SDN) and Experiment-based Research"
- 09/2015 **Global LambdaGrid Workshop and GLIF Conference**
Prague, Czech Republic
IRNC Meeting: "Software-Defined and PrivacyPreserving Network Measurement Instrument and Services for Understanding Data-Driven Science Discovery"

XI. RESEARCH & INTELLECTUAL CONTRIBUTIONS

A. PUBLICATIONS [oldest at top, newest at bottom in each section; number each within each section; published or accepted for publication/in press; NOT in preparation; follow AMA format]

Peer-Reviewed Original Research in Professional, Scientific or Educational Journals

1. Gandsas, A, McIntire K, Montgomery K, **Bumgardner V**, and Rice, L. "The personal digital assistant (PDA) as a tool for telementoring endoscopic procedures." *Medicine Meets Virtual Reality 12: Building a Better You: The Next Tools for Medical Education, Diagnosis, and Care* 98 (2004): 99.
2. Neelakantan S., Mueller T, Lee B, Finnell P, **Bumgardner V. K.C.**, and D. Carey. 2011. Web 2.0 spatial data browser for visualizing land-use assessment information from soil surveys. *J. of Soil and Water Conservation and Management*. 66:37A-39A
3. Mueller, T., Neelakantan, S., Rienzi, E., Mijatovic, B., Castrignano, A., Pike, A., **Bumgardner, V.K.C.** 2012. *Cloud Computing, Web-Based GIS, Terrain Analysis, Data Fusion, and Multivariate Statistics for Precision Conservation in the 21st Century*.
4. **Bumgardner, V.K.C.**, and Victor W. Marek. "Scalable hybrid stream and Hadoop network analysis system." *Proceedings of the 5th ACM/SPEC international conference on Performance engineering*. ACM, 2014.
5. **Bumgardner, V.K.C.**, et al. "Cresco: A distributed agent-based edge computing framework." *The International Workshop on Green ICT and Smart Networking (GISN 2016)*. IEEE, 2016.
6. **Bumgardner, V.K.C.**, et al. "Constellation: A Secure Self-Optimizing Framework for Genomic Processing." *18th International Conference on E-health Networking, Application & Services (HealthCom)*. IEEE, 2016.
7. **Bumgardner, V.K.C.**, and Victor W. Marek. "Collating time-series resource data for system-wide job profiling." *Proceedings of IEEE/IFIP International Workshop on Analytics for Network and Service Management AnNet*. IEEE, 2016

Books, Book Chapters, Monographs

1. **Bumgardner**, V.K.C, and Victor W. Marek, Educational Applications of Cloud, Book Chapter Encyclopedia of Cloud Computing, Wiley-IEEE Publication, 2016, Print.
2. **Bumgardner**, Vernon. Open Stack in Action. NewYork: Manning, 2016. Print

Letters, Book Reviews, Lay Press

1. Van den Berg, Marcel. Managing Microsoft Hybrid Clouds. Birmingham, UK: PACKT, 2015. Print
2. Case Study: HPC tailored to research needs with OpenStack cloud. Austin, TX, Dell Inc, 2017. Print
3. University of Kentucky researchers move massive data loads easily with an SDN-enabled campus network. Palo Alto, CA, HPE, 2017. Print

B. ABSTRACT PRESENTATIONS [specify type: Podium, Poster, Exhibit, Electronic, Educational Exhibit, Scientific Exhibit; oldest at top, newest at bottom in each section]

National/International Meetings

1. Mastrangelo MJ Jr, Sheetz M, **Bumgardner V.K.C**, George I, Mylniec P, Bellinghausen J. 2003. Exhibit: Immersive Real-Time Tele-Collaboration of Complex Volumetric Medical Imaging for Surgical Planning. I2/NLM/ Radiological Society of North America Annual Meeting exhibit Chicago, Illinois. December 2003
2. Beech W, **Bumgardner V.K.C**, Hesse U, Van Horn D, Jaromczyk J, Schardl C. 2006. XGrid Implementation of the InterProScan for the Epichloe festucae Genome Project. Poster session at the International Society for Computational Biology, Fortaleza, Brazil, August 2006
3. **Bumgardner, V.K.C**. 2014. Demonstration of GENI aggregate-based reporting and alerting system prototype. Poster/Demo session presented at the 19th GENI Engineering Conference, Atlanta, Georgia, USA, March 2014.
4. **Bumgardner, V.K.C**. 2014. Podium: Scalable hybrid stream and Hadoop network analysis system. Session on distributed system performance presented at ICPE14, Dublin, Ireland, March 2014.
5. **Bumgardner, V.K.C**. 2014. Podium: Demonstration of GENI aggregate-based reporting and alerting system. Operations session presented at the 21st GENI Engineering Conference, Bloomington, Indiana, USA, October 2014.
6. **Bumgardner, V.K.C**. 2015. Demonstration of multi-level real-time stream reporting system. Demo/Poster session presented at the 22st GENI Engineering Conference, Washington, D.C., USA, March 2015.
7. **Bumgardner, V.K.C**. 2016. Podium: Demonstration of GENI monitoring session. Operations session presented at the 24th GENI Engineering Conference, Tempe, AZ, USA, March 2016.

8. **Bumgardner, V.K.C.** 2016. Collating time-series resource data for system-wide job profiling. Work-shop on Analytics for Network and Service Management presented at AnNet 2016, Istanbul, Turkey, April 2016.
9. **Bumgardner, V.K.C.** 2016. Constellation: A Secure Self-Optimizing Framework for Genomic Pro-cessing. Healthcom Conference on E-health Networking, Application & Services, Munich, Germany, September 2016.
10. **Bumgardner, V.K.C.**, et al. 2016. Programmable Privacy-Preserving Network Measurement for Network Usage Analysis and Troubleshooting. Internet2 Technology Exchange, Miami, FL, USA, September 2016.
11. **Bumgardner, V.K.C.** 2016. Cresco: A distributed agent-based edge computing framework. The In-ternational Workshop on Green ICT and Smart Networking (GISN 2016), Montreal Quebec Canada, November 2016.
12. **Bumgardner, V.K.C.**, Hickey, Caylin, Shapiro, Scott, Cottle, Chad 2017. Cresco Framework: Edge Computing in Smart Cities. Poster session presented at the 2017 Smart Cities Connect Conference and Expo, Austin, TX, USA, June 2017.
13. **Bumgardner, V.K.C.**, Hickey, Caylin, Insko, George, Watkins, Brad 2017. Cresco Framework: Edge Computing in Defense Management. Poster session presented at the 2017 Defense Innovation Challenges, Tampa, FL, USA, October 2017.

C. SPONSORED RESEARCH PROJECTS, GRANT & CONTRACT ACTIVITIES

Active

Project Title: "IRNC: AMI: Collaborative Research: Software-Defined and Privacy-Preserving Network Measurement Instrument and Services for Understanding Data-Driven Science Discovery"

Project Number: 3048112416

Principal Investigator(s): V. Bumgardner, PhD

Role in Project: Principal Investigator/Co-Principal Investigator

Effort: 5 %

Institution/University: University of Kentucky

Source of Funding: NSF

Duration of Project: 04/2015-03/2018

Total Award: \$502,104

Grant Number: IRNC-1450937

Project Title: "CC*DNI Networking Infrastructure: An Software Defined Networking-Enabled Research Infrastructure"

Project Number: 3200000225

Principal Investigator(s): V. Bumgardner, PhD

Role in Project: Principal Investigator

Effort: 2 %

Institution/University: University of Kentucky

Source of Funding: NSF

Duration of Project: 10/2015-09/2017
Total Award: \$486,572
Grant Number: CNS-1541380

Project Title: "MRI: Acquisition of the Kentucky Research Informatics Cloud (KyRIC)"
Project Number: 3200000952
Principal Investigator(s): GQ Zhang, PhD
Role in Project: SP
Effort: 10 %
Institution/University: University of Kentucky
Source of Funding: NSF
Duration of Project: 08/2016-07/2019
Total Award: \$2,240,000
Grant Number: ACI-1626364

Project Title: "Collaborative Research: CICI: Secure and Resilient Architecture: NetSecOps -- Policy-Driven, Knowledge-Centric, Holistic Network Security Operations Architecture"
Project Number: 3200000871
Principal Investigator(s): J. Griffioen, PhD
Role in Project: Co-Principal Investigator
Effort: 2 %
Institution/University: University of Kentucky
Source of Funding: NSF
Duration of Project: 09/2016-08/2019
Total Award: \$499,925
Grant Number: ACI-1642134

Inactive

Project Title: "CC-NIE Integration: Advancing Science through Next Generation SDN Networks"
Project Number: 1246332
Principal Investigator(s): V. Kellen , PhD and J. Griffioen, PhD
Role in Project: Senior Personnel
Effort: 10 %
Institution/University: University of Kentucky
Source of Funding: NSF - U. of Kentucky
Duration of Project: 10/2012-09/2015
Total Award: \$997,437
Grant Number: OCI-1246332

Project Title: "University of Kentucky Ops Transition (GENI Network Monitoring)"
Project Number: 1346688

Principal Investigator(s): V. Bumgardner, PhD
Role in Project: Principal Investigator
Effort: 10 %
Institution/University: University of Kentucky
Source of Funding: NSF - Subcontract 1939C C.O. Raytheon BBN Technologies Corp.
Duration of Project: 10/2013-09/2015
Total Award: \$254,604
Grant Number: CNS-1346688

Project Title: "University of Kentucky Ops Transition (Additional Effort Funding Request for Agreement No. 1939C)"

Project Number: 1346688
Principal Investigator(s): V. Bumgardner, PhD
Role in Project: Principal Investigator
Effort: 2 %
Institution/University: University of Kentucky
Source of Funding: NSF - Subcontract 1939C C.O. Raytheon BBN Technologies Corp.
Duration of Project: 07/2015-06/2016
Total Award: \$39,846
Grant Number: CNS-1346688

Project Title: "University of Kentucky Ops Transition (Additional Effort Funding Request for Agreement No. 1939C)"

Project Number: 1346688
Principal Investigator(s): J. Griffioen, PhD
Role in Project: Co-Principal Investigator
Effort: 2 %
Institution/University: University of Kentucky
Source of Funding: NSF - Subcontract 1939C C.O. Raytheon BBN Technologies Corp.
Duration of Project: 04/2016-09/2016
Total Award: \$64,528
Grant Number: CNS-1346688

Project Title: "GENI Going Forward"

Project Number: 1536090
Principal Investigator(s): J. Griffioen, PhD
Role in Project: Co-Principal Investigator
Effort: 2 %
Institution/University: University of Kentucky
Source of Funding: NSF - C.O. Raytheon BBN Technologies Corp
Duration of Project: 04/2016-03/2017
Total Award: \$258,112
Grant Number: CNS-1536090 Subcontract

D. OTHER CREATIVE ACTIVITIES

06/2015-present **Lexington Fayette Urban County Government**
Cresco (software) for use in Smart City development

XII. OTHER ACTIVITIES

03/2014-present **OpenStack Foundation**
OpenStack Kentucky Community Organizer

04/2015-present **Docker Inc.**
Docker Lexington Community Organizer

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