

# Ian Cottingham - Curriculum Vitae

## Professional Preparation

*Ph.D. in Computer Engineering, University of Nebraska – Lincoln, (Incomplete)*

M.S. in Computer Science, University of Nebraska – Lincoln

B.S. in Computer Science (double major in German), University of Nebraska – Lincoln

## Appointments

2017 – Present: Software Development Manager, Amazon Web Services, Seattle, WA.

2013 – 2017: Director of Design Studio, JS Raikes School, University of Nebraska – Lincoln.

2012 – 2017: Assistant Professor of Practice, JS Raikes School, University of Nebraska – Lincoln.

2011 – 2012: Managing Director, Innovation Labs, Dept. of CSE, University of Nebraska – Lincoln.

2003 – 2011: Software Architect, Dept. of CSE, University of Nebraska – Lincoln.

1998 – 2002: Preprofessional Engineer, IBM, Somers, NY.

## Employment

Amazon Web Services, Seattle, WA

**Software Development Manager**, January 2017 - Present

- Managed a team of 9 engineers and 1 TPM,,
- Responsible for developing a vision for the Host Lifecycle Management team, integrating our services within EC2 and designing new services to address identified business problems,
- Successfully launched a service to refresh the entire EC2 fleet over deterministic time interval,
- Responsible for utilization of prior generation EC2 instance families,
- Member of the EC2 Capacity Lifecycle leadership team,

Jeffrey S. Raikes School of Computer Science and Management, University of Nebraska – Lincoln, NE

**Assistant Professor of Practice and Director of Design Studio**, May 2012 – January 2017

- Served as Associate Director of the Raikes School from July 1 to December 31, 2015, responsible for academic and non-academic operations of the School during the transition to a new executive director.
- Responsible for Design Studio organization of 130 faculty, staff, and student developers building software for ~25 industry partners annually.
- Led integration effort to expand Design Studio to provide capstone courses outside of the Raikes School to any student majoring in computer science, computer engineering, or software engineering, and any student minoring in informatics, or software development.
- Grew Design Studio revenue from \$400,000 to \$900,000 annually, increasing project capacity from 12 to 25, and managed industry relationships with over 45 companies including Microsoft, IBM, Mutual of Omaha, Cerner, and HDR.
- Restructured curriculum and engineering process to focus on rapid release-driven software development, enhancing the scope and quality of software developed in Design Studio.
- Program director for computer science program in the Raikes School, teaching Software Engineering, Software Architecture, Design Thinking, and Programming Languages.
- Responsible for the strategic positioning of the Raikes School as a leader in Design Thinking: co-developed a Design Thinking course, served as co-team lead on a partnership with Stanford through the Pathways to Innovation program, developed courses focused on interdisciplinary concepts relative to innovation.

Red Brain inc., Lincoln, NE

**President**, December 2009 – December 2015 (acquired)

- Architect and lead developer of law enforcement software (Java EE backend / iOS client) to identify persons of interest in the field deployed in AWS EC2 environment.
- Architect and lead developer of an ASP.NET MVC asset management system used to track vehicles and city employees. The system processed ~15 requests per second under normal operating conditions.
- Successfully negotiated intellectual property license from University of Nebraska, a software reseller agreement to increase speed of market entry of the products, and a sale of IP assets to a competitor.

Department of Computer Science and Engineering, University of Nebraska – Lincoln, NE

**Managing Director, Innovation Lab** – May 2011 – May 2012

**Software Architect**, January 2003 – May 2011

- Responsible for a software development organization of 9 professional engineers developing software products to support grant funded research. The organization helped secure over \$10 million of funding between 2003 and 2009.
- Architect and principal engineer for a framework for deployment of multiple GIS-based decision support applications into a common application base, integrating with legacy CORBA components, GIS systems, and data repositories.
- Architect of a federated data discovery system for integrating large taxonomic and genomic data sets.
- Architect and principal engineer for a web-application to integrate historical datasets describing the growth of 19<sup>th</sup> century America.
- Lead author of a data specification for the Association of Information Referral Systems in partnership with the Nebraska Public Policy Center.
- Led the development effort for implementing both application and framework architectures and created user-level web application interfaces for multiple research projects.
- Supervised graduate student research projects and taught Introduction to Software Engineering.
- Worked with private sector IT clients to create lecture series and software engineering projects to foster greater interaction with CSE students and research faculty.
- Interacted with research partners to create software to encapsulate methodologies for climate and risk analysis into the enterprise framework for application development. Managed the requirements process and transitioned the application base from disparate systems into a single cohesive service framework.

OrangePeel Inc., Lincoln, NE

**President**, March 2003 – December 2008

- Co-Founder of a software company to development knowledge management software with a focus on industry process management and workflow automation.
- Managed requirements process with partner insurance company to determine software use cases and identify business process rules for software.
- Architected data management, image archival and business process automation software solution for the management of insurance policies.
- Led development of an insurance claims archival web framework.
- Oversaw development of policy management software.

J.D. Edwards Honors Program, University of Nebraska – Lincoln, NE

**Special Topics Lecturer**, August 2002 – December 2005

- Lectured on special topics for Software Engineering, Intro to CS and Junior/Senior design courses.
- Provided project software architecture and design support for junior/senior design course, working directly with teams and clients, and lecturing on various software engineering topics in class.

IBM Global Services, Business Innovation Services, White Plains, NY

**Preprofessional Engineer**, March 2001 – June 2002

- Led interface development effort, creating application interface designs as well as testing procedures to validate both functionality and adherence to client specified requirements.

- Provided component level documentation for the application to be used in functional requirement documentation.
- Designed and implemented a multi-threaded task management system.
- Co-designed and developed an interface for a content management tool, integrating a task management engine for remote task processing by the content management tool.
- Managed final bug-fix and deployment of SI Hub interface.

IBM Global Services, Business Enable Solutions, Somers, NY

**Preprofessional Engineer, June 1998 – March 2001**

- Oversaw the development of the web front-end for several iterations of a Java and Lotus Domino-based web portal for tracking consulting engagements.
- Designed and developed both a web application interface and stand-alone application backend as a prototype for personalization of an information portal.
- Authored prototype technical specification.
- Designed and managed development of integration code to tie prototype functionality into existing application framework, successfully providing prototype proof of concept.
- Managed vendor hired to create an application interface, coordinating development to insure the interface was developed according to specifications set forth in the application user interface design document.
- Wrote the Portal User Interface Design Document, based on application architecture requirements for application functionality.
- Managed integration of the application interface, validating and verifying specifications defined in the Portal User Interface Design Document.
- Co-authored application functional specification.
- Led interface development meetings and presentations to management to gather requirements for interface development.
- Created a specification for design and development of standards compliant portal applications.

**Research Activities**

**Funding as Principal or Co-Principal Investigator**

1. Robert B. Daugherty Water for Food Institute. Phocalstream, 2012-2014. \$80,000, PI.
2. Digging into Data Competition, National Endowment for the Humanities, Office of Digital Humanities. Railroads and the Making of Modern America. 2009-2010. \$100,000, CO-PI.
3. Association of Information Referral Systems. Data Specification and Validation System. 2008-2009. \$16,000, PI.
4. Region V Services of Nebraska. Web Based Education System. 2008-2009. \$47,950, PI.
5. Red Cross, Coordinated Assistance Network. A Case Study of Data Sharing: 211 Helplink and the ARIS XSD. 2008. \$20,000, CO-PI.

**Funding as Project Director or Advisor**

1. National Institute of Justice. Evaluation of Location-based Services for Police. 2010-2013. \$50,000, Project Director.
2. Harvard University. Life on Earth. 2010-2013. \$188,204, Advisor.
3. US Department of Health and Human Services. ARRA: World of Viruses. 2009-2011. \$200,000, Project Director.
4. National Science Foundation (NSF 0743783). Semantic Cyberinfrastructure for Information and Discovery. 2009-2011. \$1,370,000, Project Director.
5. United States Department of Agriculture, Risk Management Agency. Drought Risk, Impact and Mitigation System (USDA-RMA 05-IE-0831-0254). 2005-2010. \$5,000,000, Project Director.
6. United States Department of Agriculture, Risk Management Agency. Climate and Soil Risk Information System (USDA-RMA 02-IE-0831-0028). 2005 – 2008. \$2,500,000, Project Director.

**Publications**

1. D.W. Keck, I.J. Cottingham. Using Innovation as a Catalyst for Integrating Business and Engineering Education. 2016 IEEE Frontiers in Education Conference.
2. D.W. Keck, I.J. Cottingham. Intersection: fostering innovation in undergraduate education through thematic interdisciplinary programs. Open 2016.
3. I.J. Cottingham. A Service Oriented Architecture for Data-Driven Decision Support Systems. Masters Thesis, University of Nebraska – Lincoln, 2009.
4. I. J. Cottingham, B. B. Kutsch, N. C. Shank. A Case Study in Data Sharing: 211 Helplink and the AIRS XSD. 2008.
5. X. Wu, I.J. Cottingham. Using Web 2.0 and ESIR for Rich Climate Analysis. ESRI Users Conference. August 2008.
6. B. Prabhakar, I. J. Cottingham, S. Goddard. A Value Based Caching Framework for Data-Driven Distributed Systems. JBoss World. March 2005.
7. W. J. Waltman, S. Goddard, S. E. Reichenbach, G. Gu, I. J. Cottingham, J. S. Peake, T. Tadesse, S. K. Harms, J. S. Deogun. Digital government: reviving the newhall simulation model to understand the patterns and trends of soil climate regimes and drought events. dg.o '04: Proceedings of the 2004 annual national conference on Digital government research. May 2004.
8. I. J. Cottingham, S. Goddard, S. Zhang, X. Wu, K. Lu, A. Rutledge, W. J. Waltman. Demonstration of the National Agricultural Decision Support System. dg.o '04: Proceedings of the 2004 annual national conference on Digital government research. May 2004.
9. W. J. Waltman, S. Goddard, P. E. Read, S. E. Reichenbach, I. J. Cottingham, J. S. Peake. Digital Government: new tools to define terroirs and viticultural areas in the northern great plains. dg.o '04: Proceedings of the 2004 annual national conference on Digital government research. May 2004.

#### **Presentations and Panels**

1. Innovation Processes, UNL Women in Business Conference, 2017.
2. Using Innovation as a Catalyst for Integrating Business and Engineering Education, Frontiers in Education Conference, 2016.
3. Fostering innovation in undergraduate education through thematic interdisciplinary programs, Open, 2016.
4. Design Thinking for Strategic Innovation. Westside Community Schools, Develop U, 2015.
5. Data from Field to Global Scales. Water for Food Global Conference, 2014.
6. Phocalstream: Bringing the Power of Photography to the Cloud. Water for Food Global Conference, 2013.
7. So, you need a CTO? Intersect, 2013.

#### **Innovation and Technology Transfer**

1. Developed RAIK 101 – Innovation Processes, an introductory course in the Raikes School designed to introduce innovation topics related to computer science and management to freshmen.
2. Developed student startup acceleration program in Design Studio based on Lean Launchpad methodology.
3. Collaborated with UNL Pathways to Innovation Team and Nebraska Innovation Campus Faculty Advisory Committee to co-develop an innovation curriculum and honors program to be taught at NIC.
4. Co-developed DSGN 110 with UNL College of Architecture faculty.
5. Co-developed and co-taught an interdisciplinary data analysis course for digital humanities with UNL History Department faculty.
6. Intellectual Property Disclosure and Technology License. Police Patrol Information System (NIJ). NUtech Agreement #1609A.
7. Intellectual Property Disclosure and Technology License. World of Viruses Comic Viewer (NIH). NUtech Agreement #1302A.

#### **Community Available Work Products**

1. Robert B. Daugherty Water for Food Institute. Phocalstream. <https://github.com/icotting/Phocalstream>.
2. National Endowment for the Humanities. The Aurora Project. <https://github.com/icotting/The-Aurora-Project>.
3. National Science Foundation. The Biofinity Project. <https://github.com/Biofinity/Biofinity>.

4. United States Department of Agriculture. The GreenLeaf Project. <https://github.com/icotting/The-GreenLeaf-Project>.
5. National Institutes of Health. World of Viruses:
  - a. Phantom Planet HD - <https://itunes.apple.com/us/app/phantom-planet-hd/id499674697?mt=8>.
  - b. The Never Ending Battle HD - <https://itunes.apple.com/us/app/the-never-ending-battle-hd/id407968051?mt=8>.
  - c. The Frozen Horror HD - <https://itunes.apple.com/us/app/the-frozen-horror-hd/id423547214?mt=8>.
  - d. The Curse of the Treeman HD - <https://itunes.apple.com/us/app/the-curse-of-the-tree-man-hd/id466433079?mt=8>.
  - e. Confined HD - <https://itunes.apple.com/us/app/confined-hd/id499686747?mt=8>.
6. US Department of Health and Human Services. Virus Nightmare Adventure - <https://itunes.apple.com/us/app/virus-nightmare-adventure/id402235831?mt=8>.

### Professional Activities and Service

- Member, Propelr Board of Advisors (2016)
- Member, UNL College of Law Entrepreneurship Clinic Advisory Board (2015 - 2016).
- Participant, Nebraska Innovation Campus Faculty Advisory Committee (2015 – 2016).
- Member, University of Nebraska – Lincoln Conflicts of Interest Review Committee (2015 - 2016).
- Faculty Fellow, Robert B. Daugherty Water for Food Institute (2015 - 2016).
- Campus Lead, Pathways to Innovation Program, National Center for Engineering Pathways to Innovation, National Science Foundation (2015 – 2016).
- Senior Technical Advisor to Together+Clinic, LLC, a Lincoln Nebraska-based healthcare startup (2014).
- Member, University of Nebraska – Lincoln Faculty Senate Subcommittee for Information Technology and Services (2013 – 2016).
- UNL Representative, CIC Technology Collaboration Learning Technology Group (2014).
- Member, Faculty Advisory Panel to NUtech Ventures Entrepreneur in Residence Program (2012).

### Teaching

- RAIK101H: Innovation Processes (2015, 2016).
- RAIK383H: Fundamentals of Software Engineering (2011, 2012, 2013, 2014, 2015, 2016).
- CSCE496: Data Analysis for Digital Humanities (2014).
- RAIK/CSCE402H: Design Studio IV (2013, 2014, 2015, 2016).
- RAIK/CSCE401H: Design Studio III (2012, 2013, 2014, 2015, 2016).
- RAIK/CSCE302H: Design Studio II (2013, 2014, 2015, 2016).
- RAIK/CSCE301H: Design Studio I (2012, 2013, 2014, 2015, 2016).
- CSCE361: Introduction to Software Engineering (2012).
- CSEC322: Programming Language Concepts (2012).
- DSGN110: Design Thinking (2013, 2014).

### Mentoring and Advising

#### Graduate Students Mentored

1. Paul Bennett (MS, 2010).
2. Bhagyashree Prabhakar (MS, 2005).
3. Ahalyia Nahtan (MS, 2005).

#### Undergraduate Students Mentored (Research, Innovation, and Entrepreneurship)

1. Brendan Baitliner (Startup, 2015)
2. Zach Christensen (Startup, 2014).
3. James Verhoeff (Startup, 2014).
4. Derreck Stolee (Undergraduate Thesis, UCARE, 2005).
5. Dan Hatch (UCARE, 2005).

6. Alex Person (UCARE 2005).
7. Jon Dokulil (Undergraduate Thesis (Design Studio), 2004).