Technology’s future begins here.

The College of Computing & Informatics at UNC Charlotte
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This is a very exciting time to be a part of the College of Computing and Informatics.

We live in the golden age of information technology, the “second machine age”, which is transforming every aspect of our society, industry, and economy. Technology’s role has expanded from tool for productivity to driving force for innovation, social, and economic transformation. The prediction that “every industry is an IT industry” is becoming a reality. These changes have created an insatiable demand for new kinds of leaders and professionals, who are not only masters of cutting edge technology but also capable of leveraging technology to create social and economic values.

The College of Computing and Informatics (CCI) at UNC Charlotte stays at the forefront of this technology-driven transformation, to support the talent and innovation needs of our region, state, and country – the future of technology starts here!

In addition to our market-leading education curriculum in Computer Science, Software and Information Systems, Bioinformatics and Genomics, Health Informatics, Computing and Design, we formally launched the interdisciplinary Data Science and Business Analytics (DSBA) program this year. Our strategic drive for developing T-shaped talents—the kind of people who not only have deep technical knowledge, but also are skilled in team work, communication, and creative problem solving—helps to redefine the meaning of quality.

This year marks the full implementation of the Data Science and Business Analytics Initiative, an innovation spearheaded by CCI but has now become the top academic priority and University-wide undertaking led by Chancellor Dubois, with the goal of establishing the Charlotte region as a hub of data science and analytics talent, and industry innovation. Working with our sister colleges, a broad array of curriculum, certificate, degree and training programs, as well as industry focused research partnerships, have been launched. You will see some examples in this issue, and more information can be found at dsba.uncc.edu.

With 85% growth in the last five years and 20% this year alone, CCI is now the largest IT program by enrollment in North Carolina, and one of the largest in the nation, with 2,000 students enrolled this semester and over 440 graduates in 2013. Our college has become the preeminent provider of technology talent for every industry in the region. The scale underscores our impact and helps to support the vast and growing needs from our industries. We see rapid growth and participation in the CCI Business Partners Program this year. It has become a key venue to provide career opportunities for our students through hundreds of internships, co-ops, and career positions, and to build a robust talent pipeline for industries in the region.

Last but not least, you will see in this issue some wonderful examples of cutting edge R&D led by CCI faculty. Boosted by 200 Ph.D. level faculty, students, and associates, and numerous sponsored projects, CCI is a vibrant research enterprise. Our faculty are leading not only cutting-edge R&D across broad spectrums of computing and informatics, but, equally important, their applications to solve societal and industry problems.

Yi Deng, Dean
College of Computing and Informatics at UNC Charlotte

CCI AT A GLANCE
100 faculty and staff members
2,000+ students, including 121 Ph.D. students
3 departments (Computer Science, Software and Information Systems, Bioinformatics and Genomics)
8 research centers and institutes
9 degree programs at bachelor’s, master’s, and Ph.D. levels
Largest technology program in North Carolina
TALENT FOR THE 21ST CENTURY
As one of the leaders in the University’s Data Science and Business Analytics Initiative, the top university academic priority, the College of Computing and Informatics (CCI) is listening to the needs of industry and business.

CCI is proactively developing, through collaboration with the Belk College of Business and the College of Health and Human Services, innovative and cutting-edge curriculum to ensure that the region and country are afforded the best professionals available to meet the needs of the 21st Century workforce. By integrating technology, business, and education into the interdisciplinary study called ‘informatics’, we are creating 21st Century leaders who can convert “Big Data” into insights, help businesses become more profitable and more efficient, and make smarter decisions than ever before.
Professional Science Master's Degree in Data Science and Business Analytics

The Professional Science Master's (PSM) degree in Data Science and Business Analytics (DSBA) is a collaboration between the College of Computing and Informatics, and the Belk College of Business. It is an interdisciplinary program at the intersection of business, computer and information sciences, statistics, and operations research. Students entering the program will have completed an undergraduate degree in economics, business, computer science, information technology, or a quantitative discipline, such as math, statistics, or engineering. The program gives students an understanding of business theory and practice as well as deep informatics and analytics skills, providing them with the knowledge and ability to lead in the development, evaluation, and deployment of business analytics and informatics applications. The program is designed to graduate students well-equipped for employment in a wide variety of data intensive industries, such as financial services, energy, retail, manufacturing, and health care, where the need for business analysts with quantitative and computational skills is growing at an explosive pace.

For more information: dsba.uncc.edu

Graduate Certificate in Data Science and Business Analytics

UNC Charlotte is now offering a graduate certificate in Data Science and Business Analytics (DSBA). This collaboration between the College of Computing and Informatics, and the Belk College of Business will provide post-baccalaureate students with the opportunity to pursue graduate studies in this highly sought-after field. The certificate in DSBA is open to all students who hold a B.S. or M.S. degree in any scientific, engineering, or business discipline, and are either currently enrolled in a graduate degree program at UNC Charlotte or completed their undergraduate degree with a minimum 3.0 GPA.

Students will complete five graduate courses to earn the certificate, studying topics such as “Big Data” analytics for competitive advantage, database systems, network science, and decision modeling. The DSBA certificate is UNC Charlotte's latest academic program related to “Big Data.”

For More Information: dsba.uncc.edu
Professional Science Master’s Degree in Health Informatics

In a continuing effort to develop talent for the 21st Century needs of business and industry, UNC Charlotte is offering the state’s first-ever Professional Science Master’s (PSM) degree in Health Informatics.

This groundbreaking curriculum, developed in collaboration between the College of Computing and Informatics, and the College of Health and Human Services, is designed to help meet the demand for innovative health information technology professionals who are urgently needed to address the mounting challenges facing the health care industry.

The PSM degree differs from a traditional master’s program; it is interdisciplinary in its approach and considered the MBA for science and technology. In addition to integrating the sciences of health and informatics, the PSM includes business “soft skills” that healthcare industry leaders are demanding: project management, communications skills, teamwork. A real-world capstone project will place students in the labs and in the workplace working directly with industry leaders. This will result in more well-rounded graduates and position them to improve the quality of health care, reduce medical errors and costs, and transform healthcare as it is known in the Charlotte region and beyond.

For more information: hi.uncc.edu
For more information: healthinformaticspsm@uncc.edu

WHERE INFORMATION MEETS HEALTH CARE

“As the healthcare industry grows, we see an increased need for professionals with the expertise UNC Charlotte’s program offers. New models of care delivery, such as accountable care, emphasize the importance of HI to connect data from physician practices, hospital, post acute providers, and other care settings to provide coordinated care for the patients they serve. The demand for HI professionals around the country will only continue to grow.”

Jeff Petry
VP of Strategic Initiatives
Premier, Inc.

Graduate Certificate in Health Informatics

The world of healthcare is changing. The emergence of new technologies, new ways of treating and diagnosing patients, and the marriage of digital and analog records are creating opportunities for professionals who can leverage their knowledge of computer science and healthcare. The Graduate Certificate in Health Informatics (HI) offers an introduction to this new world of healthcare. The HI Certificate builds a foundational understanding of the terminology, the technology, and the systems that are transforming health delivery in the United States and the world. The scope and sequence of the courses in the HI Certificate mirror those of the (PSM) in HI. Students have access to world-class faculty, facilities, and the professional networking resources of UNC Charlotte.

For more information: healthinformaticspsm@uncc.edu
Professional Science Master’s in Bioinformatics and Ph.D. in Bioinformatics and Computational Biology

These interdisciplinary programs are at the intersection of the disciplines of biology, chemistry, mathematics and statistics, computing and informatics, and engineering. The degrees include additional training and demonstrated competence in both life sciences and scientific programming. These programs are structured to provide students with the skills and knowledge to develop, evaluate, and deploy bioinformatics and computational biology applications. They are designed to prepare students for employment in academia and in the biotechnology sector, where the need for knowledgeable life scientists with quantitative and computational skills has exploded in the past decade.

For More Information: bioinformatics.uncc.edu/degree-programs
bioinformatics.uncc.edu/educational-opportunities/professional-science-masters-bioinformatics
Financial Services Informatics

The College is now offering a Bachelor of Arts degree with a concentration in Financial Services Informatics. This innovative and cutting-edge approach to curriculum, conceived by CCI along with Bank of America, Wells Fargo (then Wachovia), and TIAA-CREF, offers students a new degree concentration in order to provide highly-trained graduates who can immediately address the ever-changing demands of the financial world as outlined by financial industry leaders in the Charlotte region. The joint development of this program again emphasizes the commitment of the College to place our highly-trained graduates into the IT workforce where they can begin to provide significant value immediately.

For More Information:
cci.uncc.edu/academics/undergraduate/financial-services-informatics-concentration

Applied Technology Program

The College of Computing and Informatics, and the Belk College of Business have engaged in a strategic partnership with Bank of America that involves students performing work for the Bank and participating in career-oriented study while pursuing their undergraduate degrees. The Applied Technology Program (ATP) provides real-world experiences in the financial service industry. Students develop a key understanding of technology, as it’s used in the field, and they learn how to integrate that technology within the financial services industry. For students who are always eager to understand how their academic learning impacts the business world and actively pursue coursework that enhances their job prospects, the ATP offers a real-world work and study experience that greatly enhances the quality of their education and their marketability after graduation.

For More Information: atp.uncc.edu
Department of Bioinformatics and Genomics

Bioinformatics and Genomics are two of the major drivers of the emerging biomedical and biotechnology revolution. This department is one of the few of its type in the U.S. and is at the forefront of 21st Century biological sciences, from plant genomics to ecology to medicine. These programs focus on applying new computational techniques to important, but very difficult, problems in biology and biomedicine. Faculty have active, federally-funded research programs in genomics, structural biology, molecular biophysics, systems biology, and biotechnology platform development. The department plays a critical role in the development of a robust biotechnology industry in the Charlotte region through its Bioinformatics Service Division at the North Carolina Research Campus at Kannapolis, NC.

RESEARCH AREAS:
• Plant genomics
• Metagenomics
• Proteomics and metabolomics
• Structural bioinformatics
• Molecular biophysics
• Micro-array data analysis and genomic visualization
• High performance computing
• Systems biology

bioinformatics.uncc.edu
Department of Software and Information Systems

The Department of Software and Information Systems (SIS) is a pioneer in information technology research and education with an emphasis on designing and deploying integrated, secure, reliable, and easy-to-use IT solutions. SIS offers a wide selection of courses in information technology, information security and privacy, human-computer interaction, web development, and software engineering.

RESEARCH AREAS:
- Information security and privacy
- Analysis, design, and modeling of information systems and networks
- Human-Computer Interaction
- Social, ethical, and policy issues related to information technology

sis.uncc.edu

Department of Computer Science

The Department of Computer Science, with 30 faculty members and over 1,000 students, is one of the largest in the Southeast. Its new, lab-based, multi-path curriculum is helping to develop the workforce to meet the 21st Century demands of industry. These highly-trained graduates will be pursuing career opportunities in banking, insurance, analytics, gaming, data warehousing, web services, biomedical informatics, healthcare, and energy.

RESEARCH AREAS:
- Visualization and analytics
- Databases and knowledge discovery
- Artificial intelligence
- Game design and development
- Robotics
- Wireless networking

cs.uncc.edu
The College of Computing and Informatics focuses on balancing the fundamental science of computing with cutting-edge technology.

**Ph.D. Program**

The Ph.D. program in the College of Computing and Informatics is the largest and fastest-growing at UNC Charlotte with almost 121 doctoral students. The program is uniquely designed to train Ph.D. students in innovative, interdisciplinary research of societal relevance, centered on computing and informatics. The program is staffed with a strong multidisciplinary faculty of international stature, which offers opportunities for students to develop advanced competencies in a number of related fields. Students who aspire to do academic research and teaching will benefit immensely from the diverse faculty and exposure to practical applications for their specialties.

**RESEARCH FUNDING:**
Highly-competitive faculty with over $20 million in active research grants.

- National Science Foundation (NSF)
- National Institute of Health (NIH)
- Department of Defense (DoD)
- Department of Energy (DoE)
- Department of Homeland Security (DHS)
- Army Research Office (ARO)
- Major industrial funders

cci.uncc.edu/academic-programs/phd

Over 80% of Ph.D. students are fully-funded through assistantships and fellowships.
Undergraduate Programs

COMPUTER SCIENCE
- BS Computer Science
- BA Computer Science
- BA Computer Science, Financial Services
  Informatics Concentration
- Certificate Program in Computer
  Game Development

SOFTWARE AND INFORMATION SYSTEMS
- BA Software and Information Systems
- BA Software and Information Systems, Financial
  Services Informatics Concentration
  cci.uncc.edu/academic-programs/bachelors

DEPARTMENT OF
BIOINFORMATICS AND GENOMICS
- Minor
  bioinformatics.uncc.edu/degree-programs/
  undergraduate-minor-bioinformatics-and-genomics

Graduate Programs

BIOINFORMATICS AND GENOMICS
- Ph.D. in Bioinformatics and Computational Biology
- Professional Science Master’s in Bioinformatics
- Certificate in Bioinformatics Technology
- Certificate in Bioinformatics Applications

COMPUTER SCIENCE
- Ph.D. in Computing and Information
  Systems, Computer Science Track
- M.S. Computer Science
- Certificate in Advanced Databases and Knowledge Discovery
- Certificate in Game Design and Development

SOFTWARE AND INFORMATION SYSTEMS
- Ph.D. in Computing and Information Systems,
  Software and Information Systems Track
- M.S. Information Technology
- Certificate in Management of Information Technology
- Certificate in Information Security and Privacy
- Certificate in Health Information Technology
  cci.uncc.edu/academic-programs/masters
  cci.uncc.edu/academic-programs/phd

COLLABORATIVE PROGRAMS
- Professional Science Master’s and Graduate
  Certificate in Data Science and Business Analytics
  College of Computing and Informatics,
  and Belk College of Business
  dsba.uncc.edu
- Professional Science Master’s and Graduate
  Certificate in Health Informatics
  College of Computing and Informatics,
  and College of Health and Human Services
  hi.uncc.edu
- Dual Master of Architecture III/Master of Science in
  Computer Science or Information Technology
  College of Computing and Informatics,
  and College of Arts + Architecture
  coaa.uncc.edu/academics/school-of-architecture/
  degrees/master-of-architecturecomputer-
  science-or-information-techn
With over 50 research faculty supported by 121 Ph.D. students, post-docs, and research associates, CCI offers a highly competitive, collaborative research effort, that bridges fundamental research with critical scientific, societal, and national defense challenges.

**The Bioinformatics Research Center**

The Bioinformatics Research Center (BRC) offers space for both wet and dry laboratories and includes core facilities for molecular biology, proteomics, and computing. Additional genomics and proteomics core facilities are available through a UNC Charlotte partnership with the Carolinas Medical Center. The BRC has also taken a leadership role in developing bioinformatics programs in collaboration with the developers of the North Carolina Research Campus, a billion-dollar, 350-acre research park that is home to the research programs of a large number of private biotechnology companies as well as university and medical research programs.

For more information: brc.uncc.edu

**Center for Configuration Analytics and Automation**

The University of North Carolina at Charlotte and George Mason University have formed the Center for Configuration Analytics and Automation (CCAA) under the National Science Foundation’s (NSF’s) Industry/University Cooperative Research Center (I/UCRC) Program. The Center enables collaborative industry and government directed research in configuration analytics and automation capabilities, and their integration for the efficient, accurate, and timely operations management and defense of complex networked information technology systems and environments. It also fosters the encouragement and development of top-quality graduates with knowledge and experience in this field.

For more information: ccaa-crc.org
The Charlotte Visualization Center

The Charlotte Visualization Center strives to develop and promote the science of visual analytics and to advance interactive visualization as an integrative discipline that is indispensable for attacking key real-world applications. The Center is one of five regional centers across the United States that is supported and funded by the Department of Homeland Security. The Visualization Center is also a formal partner in conjunction with two of the Department of Homeland Security’s Centers of Excellence.

For more information: viscenter.uncc.edu

Complex Systems Institute

The Complex Systems Institute (CSI) brings together academia, industry, and federal agencies to advance computing simulation, analysis, and modeling. Tools developed by CSI members help analysts model infrastructure and social networks, visualize and understand how individual networks behave, and understand multiple-network interdependency behavior, including second- and third-order effects and unintended consequences.

There are two centers within the Institute. The Complexity Laboratory focuses on dynamic nonlinear systems and the development of tools and techniques for studying complexity in natural, physical, and social domains. The Defense Computing Center is responsible for defense- and intelligence-related research, emphasizing system-of-systems modeling and simulation for analysis of complex problems and phenomena.

For more information: complexity.uncc.edu

CCI Center for Education Innovation

The CCI Center for Education Innovation (CEI) is established in the College of Computing and Informatics for the development and coordination of externally-funded projects that incorporate strategies and new technologies for innovation in computing and informatics education. This Center builds on and extends the efforts of the Diversity In Information Technology Institute (DITI) and the Students in Technology, Academia, Research, and Service (STARS) Alliance, where DITI has a focus on increasing diversity in the students that choose computing as a career path and STARS establishes educational practices and programs that broaden the skills of computing students.

For more information: cei.uncc.edu

The Cyber Defense and Network Assurability Center

The Cyber Defense and Network Assurability (CyberDNA) Center offers high-impact, quality research and education in the area of network security, defense, assurability, and privacy. Specific domains of interest include assurable and usable network security configuration, security automation, security evaluation and optimization, security policy synthesis, and problem/threat diagnosis. In addition, the CyberDNA Center seeks novel, scalable authentication, accountability, and privacy techniques for emerging technologies, as well as critical infrastructure networks. The CyberDNA Center offers an excellent educational environment through conferences, seminars, mentoring, and security labs and test beds, which attract many graduate and undergraduate students to pursue rigorous research.

For more information: cyberDNA.uncc.edu
The Defense Computing Center

The Defense Computing Center conducts basic and applied research in computing-related disciplines to address society’s defense, intelligence, and security challenges. Research within the Center emphasizes integrated modeling and simulation for analysis of complex problems and phenomena, with application areas including critical infrastructure protection, multi-network interdependency and consequence analysis, and information infrastructure behavior analysis.

For more information: complexity.uncc.edu

Safety, Security, and Rescue Research Center

Industry University Cooperative Research Center, I/UCRC, is a National Science Foundation (NSF)-funded consortium of companies and universities working together on industry-relevant research in an emerging field. The SSR-RC is the only NSF I/UCRC focused on robotics technologies with a focus on such topics as healthcare, manufacturing, homeland security, and emergency preparedness and response. The mission of the SSR-RC is to conduct partner-oriented, multi-disciplinary research on computation-driven robotic and sensor systems augmented by data analysis, to improve the safety, capability, and well-being of humans.

For more information: ssrrc.uncc.edu

The Distributed Artificial Intelligence Research Laboratory

The Distributed Artificial Intelligence Research Laboratory is concerned with the design and development of reasoning techniques for resource-bounded, single- and multi-agent systems. Lab members conduct research in meta-cognition, monitoring and control of computation, safety in multi-agent systems, reinforcement learning, resource-bounded reasoning, and reasoning under uncertainty.

For more information: dair.uncc.edu

Video and Image Analysis Lab

The Video and Image Analysis Lab (VIA lab) in the Department of Computer Science at UNC Charlotte focuses on research that shapes the future of how people interact with computers. Primary research areas are biomedical image analysis, computer vision, human-computer interaction, virtual environments, and virtual humans. Our work addresses interdisciplinary problems that engage the broader community, which includes the University, the City of Charlotte, and beyond. The VIA lab provides a stimulating, collaborative environment for working on the most interesting, socially-relevant research questions in computing.

For more information: vialab.uncc.edu

The Human-Computer Interaction Lab

The Human-Computer Interaction (HCI) Lab investigates novel ways for people to interact with computers and, through computers, with their environments. Research covers a broad range of areas related to Human-Computer Interaction, such as Novel Interaction and Multimedia, Computer Supported Cooperative Work, and Privacy. We collaborate with researchers in a number of areas related to HCI, such as visualization, virtual reality, gaming, and technical communications.

For more information: hci.uncc.edu
Laboratory of Information Integration, Security, and Privacy

The mission of the Laboratory of Information Integration, Security, and Privacy (LIISP) is to add value to the university, community, and society through innovative educational programs, research, and development in the areas of information integration, security, and privacy. We aim to be one of the leading academic institutions for research in information integration, security, and privacy, and to provide innovative education and training programs in information integration, security, and privacy. For more information: liisp.uncc.edu

The Intelligent, Multimedia, and Interactive Systems Lab

The Intelligent, Multimedia, and Interactive Systems (IMI) Lab focuses on investigating novel technologies and methodologies to enable and support intelligent interactions for effective use of information in various forms, and for optimal performance of tasks involved. This can include computers, robots, and other machines that interact intelligently with humans, the physical world, and each other. For more information: imilab.uncc.edu

Interaction Design Lab

The Interaction Design (InDe) Lab investigates how novel interface technologies can be applied to change the way we think, work, and behave. We combine methodologies from interaction design, human-centered computing, and design cognition to explore new approaches to learning, participating, and creating. Current research focuses include tangible and gestural interaction, crowdsourcing, citizen science, and computational and cognitive studies of creativity.

The Knowledge Discovery in Databases Lab

The Knowledge Discovery in Databases (KDD) Lab conducts research related to the design, analysis, and implementation of data mining theory, systems, and applications, including data mining algorithms and methods, distributed data mining, ontologies, multimedia databases, distributed knowledge systems, soft computing, and application areas, such as electronic commerce, bioinformatics, business intelligence, music information retrieval, and web intelligence. For more information: kdd.uncc.edu

The Networking Research Lab

The Networking Research Lab conducts research in the areas of mobile network architectures and protocols; mobile computing (models, algorithms, and middleware); survivable networks; wireless ad hoc and sensor networks; three-dimensional networks; design, visualization, simulation, and modeling of network protocols; and network security. For more information: nrl.uncc.edu
DRIVING CURRICULUM FOR THE 21ST CENTURY
As the Director of the Data Science and Business Analytics Professional Science Master’s (PSM) degree program and Faculty Director of the Health Informatics PSM, Mirsad Hadzikadic, Ph.D., represents the educational component of the Data Science and Business Analytics Initiative.

“I oversee the curriculum development, modifications, and adjustments, as well as participate in advising students, meeting with potential students to discuss the benefits of the programs, and helping them to find internships, among other things,” says Dr. Hadzikadic. “I also recruit companies to participate on our advisory boards and work with industries to help them understand the benefits of the program and why their own employees may want to participate. I encourage them to hire our students and get input from these companies on how we might improve these graduate programs over time. Joshua Hertel, a co-administrator of these programs, provides tremendous help in supporting students as they apply and go through this educational experience. He supports the creation and operations of the PSM Advisory Board as well.”

It is critical for us to not only understand the talent needs of business and industry, but also to be able to deliver on it, which we have achieved with our PSM degree programs.
Dr. Hadzikadic says the PSM programs are career oriented, affording students practical hands-on experience on projects, while developing soft skills, such as leadership and communications. He says the College of Computing and Informatics (CCI) and the University have been listening to the talent needs of business and industry, and developed the programs to meet those needs. Also, Dr. Hadzikadic says although all of the programs are collaborative efforts between CCI, the Belk College of Business (BCOB), and the College of Health and Human Services (CHHS); the fact that they are offered under one roof, the Graduate School, is significant in that very few universities are structured in a way that enables them to offer interdisciplinary programs in such an integrated fashion. He says it also shows we understand the larger mission of the University and that the University has the resources to offer these programs effectively and efficiently.

"In the case of the Data Science and Business Analytics PSM, we were one of the first universities in the country to do it,” says Dr. Hadzikadic. “This unique collaboration between CCI and the Belk College of Business is significant in that it is geared toward producing data scientists who understand both the business problem at hand, and the data and computational tools required to analyze it. It is critical for us to not only understand the talent needs of business and industry, but also to be able to deliver on it, which we have achieved with our PSM degree programs. It is important to notice that even the Health Informatics PSM, a collaboration between CCI and CHHS, is heavily focused on analytics."

Dr. Hadzikadic says that everyone by now agrees that we are producing more data than ever before. However, the way we deal with this flood of data is changing. He says it used to be that we would define a problem, observe it, come up with a hypothesis, develop a theory that addresses it, apply the theory, and then evaluate if it works. Today, Dr. Hadzikadic says, instead, we are using computational tools and analytics to sift through the massive volumes of data, and then we let
the data tell the story itself. This data-driven, hypothesis-generation approach is truly revolutionary.

“Companies are finally starting to recognize the importance of this new approach to data analytics, but they also understand that they don’t have the trained talent to deal with and understand the age of Big Data,” says Dr. Hadzikadic. “They now truly believe that they need data scientists who can look at the data, deploy techniques, interpret those results in the context of a business problem, and, in return, improve the overall performance and competitiveness of the company.”

Dr. Hadzikadic adds that this is why the PSM programs are so important. They provide graduates and future employees with a mindset or framework that is required for developing practical elements of solutions needed for addressing the issues of importance to businesses today. He says people see the PSM degree as a career change, a move up in their career, or as an opportunity to add to an already impressive set of skill sets.

“I see this as an opportunity,” says Dr. Hadzikadic, “to gain the ability to think differently in the age of technology, which is what the PSM degree offers to students. This is a degree that is practice oriented, gives real time, measurable skills, and opens up a new set of opportunities in students’ life.”
“As a University of North Carolina at Charlotte alumnus, I am proud to say that I owe all of the success in my career to the teaching and direction I received while enrolled in the Bioinformatics and Genomics Professional Science Master’s PSM program.”

Stephen McGee received his PSM in Bioinformatics and Genomics in 2009. Within a month of graduation, he was working as a Bioinformatics Specialist for a non-profit genetics center in Greenwood, South Carolina.

“Within a few weeks, I was already exceeding the expectations of my superiors with the programming skills and knowledge of next generation sequencing that I had learned while enrolled in the program,” says McGee. “As a result, we were six months ahead of schedule at the genetics center after they realized how powerful the tools of bioinformatics can really be.”

McGee says, when he entered the program, he had very little coding background but that soon changed. He says they would literally throw a project at you and you just learned...
coding as you went along, because you had to in order to figure out the project. McGee says he really enjoyed the challenge as he was teaching himself along the way. He says that type of mentality has carried over into his current job and helped him to excel.

“As a Bioinformatics Specialist at a genetics center, I work in a diagnostics setting,” says McGee. “I physically never see the patients, and rarely do I even know any of their personal information. I’m supplied with the phenotype associated with the raw sequencing genetic data from the patient that is either sent to us or sequenced in house. Personally, I align this information to a reference genome. All discrepancies found between this patient and said reference, or between the patient and their parents, are recorded and then investigated.”

McGee says he and his colleagues find which mutations make the most sense with the associated phenotype, using public databases and programs they have written for cross-comparison of patient data. They then submit their findings to a set of directors for follow-up validation. He says this modern way of dealing with patients is supplying invaluable information to doctors. McGee says doctors can take this information and determine if a person could be more susceptible to certain diseases, or diagnosing a disease and developing specialized...
medicine for that specific patient. “Our pipeline has been honed over the years to allow us to offer the quickest turnaround time possible,” says McGee. “A physician and his patient may be waiting on this information for a specific diagnosis. It is definitely a more pressured environment because of the immediacy, as we have to analyze mutations as quickly and accurately as possible.”

McGee says it is a very different job market these days. He says it’s not about job security but skill set security. “Knowing different programming languages in an emerging field that is going to be on the forefront is critical,” says McGee. “You have to be multi-lingual in coding languages to succeed in this 21st Century workforce. Once you obtain these needed skills through the PSM program in Bioinformatics and Genomics, you will be among the elite at your trade.”
For the last four and a half years, Tyler Coverdale has been working as a data analyst for Premier, Inc., here in Charlotte. Premier, Inc. is a healthcare performance improvement alliance of approximately 3,000 U.S. hospitals and 110,000 other providers. As an industry leader, the Premier alliance has created one of the most comprehensive databases of actionable data, best practices, and cost reduction strategies. Tyler is an Implementation Project Manager for a data warehouse, managing accounts for current customers and new customers as they come on line. Over a year ago, Coverdale decided to get his master’s degree. Upon further research, he learned about the Professional Science Master’s (PSM) in Health Informatics degree being offered by UNC Charlotte, a collaborative effort between the College of Computing and Informatics (CCI) and the College of Health and Human Services. “As a data analyst in the healthcare field, it seemed like the perfect fit for me,” says Coverdale.

The PSM in Health Informatics brings it all together. You get a good mix of how to understand the data that is made available, and how it can be managed and leveraged for the best outcomes.
“It was right in line with what I was currently doing and what I like to do, which is work with data. It made sense for where my career was at the time and where I wanted to go in the future.”

Coverdale says in healthcare you have a lot of folks trained on the data science side or a lot who understand the business management side of projects. However, he says it’s rare to find someone with training that understands both disciplines, a talent that 21st century business and industry executives are clamoring for and can’t find enough of.

“The PSM in Health Informatics brings it all together,” says Coverdale. “You get a good mix of how to understand the data that is made available, and how it can be managed and leveraged for the best outcomes. Understanding the data science side along with
business management puts you ahead of the rest and give companies the competitive edge.”

Coverdale says the degree will definitely afford him more opportunities within Premier, Inc. He says it allows you to better understand what hospitals are going through, the skillset to help them understand the data they have, and ultimately come up with solutions to a myriad of issues.

“I would definitely recommend the PSM program to anyone with an interest in the healthcare field, particularly when it comes to analyzing data and how to manage it to leverage the best outcomes,” says Coverdale. “It’s the wave of the future and if you have the training that is provided thru the PSM in Health Informatics, you will be highly skilled and much in demand.”
The Applied Technology Program (ATP) is a perfect example of university and industry partnership. It is a unique partnership between Bank of America Global Technology and Operations and the University of North Carolina at Charlotte College of Computing and Informatics and the Belk College of Business. This seventeen-month program helps students not only continue with the normal classroom experience during the course of the program, but it also provides a real-life hands-on experience focused on technology within the financial services industry.

“A program like this affords students the opportunity to get experience on both the technology and the business side of the financial industry,” says Bank of America ATP Manager, Meghan Stamper. “This includes leadership, financial, and technology training all driven by input from our top executives to best prepare college students for entry into full-time roles post graduation at the Bank.”

The partnership with UNC Charlotte allows us to mutually develop the best program for the students and develop and strengthen the students skills set so they will be ready to join the workforce.

Meghan Stamper
Manager, Applied Technology Program
Bank of America Global Technology and Operations

North Carolina at Charlotte College of Computing and Informatics and the Belk College of Business. This seventeen-month program helps students not only continue with the normal classroom experience during the course of the program, but it also provides a real-life hands-on experience focused on
complete the program. Of those, 86% are now working in full-time technology-related positions, of which 94% have been retained after five years. Although full-time technology positions are not guaranteed after the program, ATP prepares students to land and take on exciting technology positions across Bank of America upon program completion.

Stamper says the program is a tremendous technology talent pipeline for Bank of America to pull from and helps support its recruitment efforts. She says as the program continues to grow, other lines of business within the Bank have been showing an interest in these graduates and their expertise.

“When the program first started, it was a technology program,” says Stamper. “Over the years it has evolved into a broader program not only developing talent in technology, but also in production support, technology project management, business support and analysis, and many other areas.”

Over the course of the seventeen-month program students work to help support components of various applications, documenting end to end processes, meeting with Bank executives, learning about the business side of organization, gaining exposure to applicable...
languages, and developing a network of peers and executives within the Bank, while at the same time continuing their basic core studies at the University.

Stamper says hiring managers find great value in what the students already know and how quickly they are able to fit into their new role as a result of having worked at the Bank. She indicates students who participate in ATP are highly sought after graduating.

“Working with the University has been a fantastic experience,” says Stamper. “This partnership allows us to mutually develop the best program for the students and develop and strengthen the students skills set so they will be ready to join the workforce.”

To learn more about the Applied Technology Program at UNC Charlotte, please visit atp.uncc.edu.
For the last seventeen months of his time at UNC Charlotte, Ashton Morris was being groomed for his current job at Bank of America. Morris, a graduate from the College of Computing and Informatics, is the team lead of Centralized Services and the Applied Technology Program (ATP), and a graduate from the ATP Program, a strategic partnership between UNC Charlotte and Bank of America. This seventeen-month program, a collaborative effort between CCI and the Belk College of Business, gives students an opportunity to get hands on experience working at the Bank, while at the same time obtaining their undergraduate degrees. The real-world experience, course content, project experience, executive mentorship, and networking opportunities combine to produce the future leaders for Bank of America.

“It was an incredible and invaluable experience,” says Morris. “You actually were a part of the Bank culture, you had access to certain systems, and were introduced to the business

You get a real look at the software development life-cycle, how it truly works, from the initial thought process, document, and business requirement gathering, all the way to the completion of the project.
side, as well as the technical side of banking—all valuable tools that allowed me to hit the ground running when I began my career at the bank.”

Morris adds, “The way the program is run day to day you get a real look at the software development life-cycle, how it truly works, from the initial thought process, document, and business requirement gathering, all the way to the completion of the project. The program is really an incubator for how software development happens, works, and continues to be used and managed within the Bank.”

Morris emphasized how the ATP is like no other in that, with a more traditional program, there is a set job you will need to fill. With the ATP, he says you are asked what you want to do, what your passion is, and then match that passion with real work experiences. He also said the mentoring from senior executives within the Bank was incredible. It included everything from mock interviews and resume critiques, to how to navigate your career and build relationships with senior level management at the Bank.

“This program is growing leaders,” says Morris. “They
are teaching you leadership qualities and how to be a leader in the Bank.”

One aspect of the program that makes it so unique is that program participants have the benefit of working alongside fellow students from different disciplines, providing them with an opportunity to learn from each other.

“It was a little intimidating at first,” says Morris. “But you were able to sit down next to someone with a totally different education background and begin learning from them immediately. There was instant communication going back and forth. It was phenomenal and I really loved that part.”

So was it worth the time and investment?

“There were times when you felt like you were drinking from a fire hose and you just couldn’t absorb it all,” says Morris. “However, you worked through it all by collaborating with your fellow classmates, peers, and mentors. The depth of the program gave you the tools to succeed, an experience I will never forget and would highly recommend.”

Ashton Morris is part of the new and innovative 21st Century workforce.
As UNC Charlotte’s Data Science and Business Analytics (DSBA) Initiative continues to grow, so do the faces that are at the forefront of the Initiative. Rick Hudson is the Senior Project Manager. In this role, he oversees among stakeholders in diverse disciplines across the UNC Charlotte community.

“Outside academia, industry, and business are used to project progressions,” says Hudson. “Program elements can provide outside clients as well as our clients with a familiar frame of reference and help to generate a high level of confidence at the earliest stages of a joint project—especially for those who might be new to working with university researchers.”

“But,” he is quick

UNC Charlotte is developing ways to look at massive amounts of unstructured data, perform sophisticated analyses to identify emerging technology trends, highlight trends of potential value, and virtually, in real time, determine who needs to know what.
to add, “Of equal importance, programmatic elements are of value only so far as they serve to render the project process transparent to all participants and enable the investigator to focus on the research itself.”

“It is my job to serve as a facilitator: the translator, if you will, between the client and the Principal Investigator on these efforts; making sure all parties are communicating with one another, and helping to manage expectations.”

Hudson says Big Data is more than a simple buzz phrase. He notes that a wide variety of industries, such as financial services, healthcare, energy, retail, and manufacturing, are learning that, in order to be successful in the 21st Century, they must be able to not only look at the data, but effectively analyze it and grasp the fruits of that analysis to devise and implement strategies enabling them to become innovative—and competitive—leaders in their respective fields.

However, Hudson points out they are also discovering they don’t have the talent to do this.

“That’s where we come in,” says Hudson. “Through collaborations with our researchers, we will be able to help clients leverage their data into success stories. It becomes a win-win for the DSBA Initiative, industry, and business, as well as the local economy. The University becomes, in effect, a research arm for its client base. Over time, many of these same clients enhance their own in-house capabilities by hiring our graduates. But as our clients’ capabilities and needs become ever more sophisticated, this can lead to even more cutting-edge research opportunities for the university. It’s another win-win scenario.”

Hudson says one of the first projects they are working on is a collaborative effort with the US Special Operations Command. He says they are looking at ways to enhance their technology scouting capabilities in support of their material acquisition efforts.

Hudson says that UNC Charlotte is developing ways to look at massive amounts of unstructured data,
perform sophisticated analyses to identify emerging technology trends, highlight trends of potential value, and virtually, in real time, determine who needs to know what. He says the tools coming out of this research will magnify the effectiveness of human decision makers who would otherwise have to wade through unmanageable amounts of raw data to draw conclusions.

Hudson says another area being explored is the world of sports.

“Sports venues, teams of all leagues and motor sports, are all looking at ways to enhance the fan experience as it is becoming very competitive out there,” says Hudson. “Whoever figures it out the best will be the winner in the long run. NASCAR now has a war room where social media is monitored throughout a race. They are analyzing that information, and coming up with innovative ways to enhance the fan experience, be it at the track or the viewer at home. We are very interested in reaching out to the motor sports community as well as our professional teams here in Charlotte.”

Hudson says to date CCI, the Belk College of Business, and the College of Health and Human Services have been the key drivers of the DSBA Initiative. But, he sees that changing in the future. Hudson says he sees it spreading across many disciplines on campus, such as anthropology, zoology, sociology, political science, and so on. “The Federal government just finished defining its data science career field. A significant number of those positions demand subject matter expertise in the social sciences. We can play a major role in equipping UNC Charlotte graduates in disciplines such as political science and sociology to be well positioned to contribute and advance in those areas.”

“This is a great time, a fascinating time, to be involved with Big Data,” says Hudson. “It is a time of discovery and innovation, a time when people are really beginning to see the power of data, and we are here to help.”
Mark Armstrong is the founder and CEO of IntePoint, a software development and services company specializing in analytics and business intelligence using innovative modeling and simulation applications. He also has been actively engaged in an eleven (11) year partnership with CCI that has involved the expansion of Department of Defense research capacities on campus. Most recently, he was hired as the new Industry/University Program Coordinator for UNC Charlotte’s Data Science and Business Analytics Initiative. “As the Industry/University Program Coordinator I wear several hats,” says Armstrong, “Moving forward I will be developing the messaging that will be used broadly by the university to help develop partnerships with business and industry. One of the key messages emphasizes that the University can provide research that will afford a competitive advantage to its partners.” Armstrong says that in addition to the messaging, he will be responsible for bringing industry and the university together, a task he very much looks forward to. “This is a very exciting time to be involved with Big Data,” says Armstrong. “Big Data analytics is on the upswing and industry knows it needs to be a part of it in order to succeed and thrive in the 21st Century. Big Data analytics is on the upswing and industry knows it needs to be a part of it in order to succeed and thrive in the 21st Century.
Century. Leading edge companies have already jumped on board, and the need is now being realized by a broader range of companies. As this happens, they are finding they don’t have the resources or understanding to make sense of their own data. We have the ability right now to help them understand potential high risk, high reward projects that will give them a competitive advantage.”

Armstrong adds Charlotte is a great place for the initiative to be based. With UNC Charlotte and major industries, such as finance, energy, healthcare, retail, and manufacturing, it is nothing but a win-win for everyone involved.

“One of our main goals is to prove that Charlotte is the center of excellence for big data analytics,” says Armstrong. “It will be the place to come as Michigan
was and is if you were a part of the automotive industry. We will start regionally but in reality it is going to be international.”

Armstrong says another exciting element about the initiative is the people that will be drawn to Charlotte.

“As the program grows so will its appeal to prospective students, be they the more traditional or those looking to make a career change,” says Armstrong. “The University will be attracting the best talent out there, allowing us to provide better employees; better trained, and more sophisticated. Through the initiative, the combination of talent and available research opportunities will truly make Charlotte the hub for innovation and research. The companies who fail to embrace the power of Big Data will eventually be left behind.”
Shannon Schlueter, Ph.D., has moved from crunching numbers in the Department of Bioinformatics and Genomics to the lead Data Scientist with UNC Charlotte’s Data Science and Business Analytics (DSBA) Initiative. In his new role, he serves as a liaison between project partners who may not have the resources to manage the project and the University. Dr. Schlueter helps to identify a faculty member who has an interest in and can benefit from such collaboration. If a member cannot be identified as a Data Scientist, he would do the coordination with the industry partner.

Dr. Schlueter’s first major undertaking is the creation of a data observatory, or repository. “We want to be able to make this information available internally to faculty and students as well as outside researchers and industry partners,” says Dr. Schlueter. “As a starting point, we want to turn the University into a living laboratory. We would take the University’s data, whether it is finance, student records, student retention, or some other, and start doing the same predictive analytics that a company would do with customer information.”
some other, and start doing the same predictive analytics that a company would do with customer information. We can turn this into a proof of concept showing improved student experience and learning outcomes. This can then be shown to potential industry partners, demonstrating things we have been able to do with the data and the potential return on investment.”

Dr. Schlueter says the initial goal is to capture the data from around the University and place it in an analytical stack so they can do the predictive analytics, and, at the same time, make sure they are on top of data governance and compliance protocols, so that they feel comfortable that the data is secure.

“Security and compliance make for some interesting challenges,” says Dr. Schlueter. “You are having to deal with multiple protocols and compliance at the same time. Data compliance comes down to three main areas: copy, access, and transferal, and how you audit and manage that.”

Dr. Schlueter says it’s about who has access and to what. Can information be copied or shared? What devices can or cannot have access to the data? How can the data be used after it is accessed? “There will be some cases, such as defense or financial services partners, where we won’t even be
able to access their data from the outside,” says Dr. Schlueter. “In those cases, we will want to be able to develop an analytical routine and actually take those routines and processes directly to them.”

Dr. Schlueter says the data observatory will showcase how predictive analytics can work across many different disciplines. He says researchers and industry partners who access the observatory may see new avenues that they may never have thought of before.

“The observatory will allow researchers and business partners to draw conclusions about their own data by overlapping many different processes and developing predictive analytics,” says Dr. Schlueter. “More and more companies want to merge their entire data stream so they can better understand the correlations. However for many, this is a high-risk venture and many do not have the in house capabilities to analyze the information. This is why the DSBA Initiative researchers and the data observatory will be invaluable tools for those who want the leading edge in the 21st Century.”
Premier, Inc. is a performance improvement alliance serving health care providers across the country. Owned by one hundred and eighty-one of these health care providers, its job is to help them deliver better care, at lower costs with higher patient satisfaction. In order to do that in 2014, says Vice President and General Manager of Enterprise Provider Analytics, Sean Cassidy, Premier has to have the ability to make sense out of health care provider data.

“Providers have a lot of data that is locked in data silos, if you will, and is not integrated,” says Cassidy. “Part of what we are doing is helping them integrate and elevate their data into trusted information and then find insights that are meaningful. Inherent in being able to do that is the ability to understand its content and meaning. It takes a lot of skill and expertise to corral the incredible amount of raw information and bring it together to do analyses.”

He says, in the 21st Century, when it comes to analysis, Premier is leveraging statistical, predictive, and prescriptive analytics. He says through this process providers are able to anticipate future performance and possibly predict risk. For example, they could forecast what could happen if a certain course of treatment is delivered in a community, a

I need people who understand data, can integrate it, and have the ability to implement advanced analytics that are meaningful.

Sean Cassidy
Vice President and General Manager, Enterprise Provider Analytics
Premier, Inc.
company expands geographically, or reimbursement rates change to determine the impact to patients and the overall business of providing health care.

“I desperately need data scientists who can do this,” says Cassidy. “I need people who understand data, can integrate it, and have the ability to implement advanced analytics that are meaningful. We want smart people, who are critical thinkers that can solve problems, and have a general background in data science and informatics. Having a knowledge and background in healthcare are extremely helpful but not critical. We can always teach the semantics and language of healthcare.”

Cassidy says Premier is very excited about UNC Charlotte’s Data Science and Business Analytics Initiative, and the Professional Science Master’s and graduate certificates now being offered in Data Science and Business Analytics, and Health Informatics.

He says, just like everyone, they are struggling to find people to fill these roles. Cassidy says the idea that these programs are being offered at the University and producing graduates with these kinds of skills, is very exciting to them.

“We see our ability to attract this kind of talent, who can do this type of work, as a strategic differentiator for us,” says Cassidy. “Our health care providers, in places like Flint, Michigan;
Springfield, Massachusetts; or Des Moines, Iowa, really struggle to find folks like this to do work for them. If we can build a concentrated set of capabilities from people in Charlotte, then we have the ability from Charlotte because of our footprint, to impact healthcare literally in every corner of the country.”

Cassidy says the Initiative is mutually beneficial to Premier, the University, and the community. He says they are already doing some health informatics work with the College of Health and Human Services, but he feels there will be many more opportunities for collaborative research in the future as there is knowledge at the University that they simply don’t have. He says, by partnering with UNC Charlotte, Premier can accelerate its understanding of a particular domain.

“In terms of Big Data, healthcare is just starting to get the picture,” says Cassidy. “Healthcare providers are beginning to understand they can differentiate themselves by becoming information-driven enterprises. We are excited about the Initiative, and very supportive of all that is being done by CCI and the University.”
Terry Cox is the founder of Business Innovation & Growth (BIG) and a member of the College of Computing and Informatics (CCI) Dean’s Advisory Board.

BIG is a non-profit membership organization, founded in 2006, comprised of like minded high growth entrepreneurial companies in this region who share similar challenges in growing their businesses. BIG provides education, content, and best practices for a growth-oriented company as well as access to resources and capital. The value of BIG is the peer-to-peer exchange that develops from being in the group.

“Our vision is to lead the development of a very robust, high growth entrepreneurial ecosystem as well as investors, as you need both to make the entire eco system work.”

This is why Cox is excited to see UNC Charlotte’s Data Science and Business Analytics (DSBA) Initiative, led by CCI, the Belk College of Business, and strategic input from the College of Health and Human Services, gain so much momentum.

“With the DSBA Initiative, you will be developing highly skilled individuals,” says Cox. “The more
highly skilled talent we can have in the region, the better the opportunity for entrepreneurial ventures as well as for the large corporations. Sophisticated tech talent with a business mindset is going to be a game changer for the region.”

Cox says that as a result of this Initiative, entrepreneurial companies could start creating positions for data scientists. In fact, she says, I am already working with several smaller companies that are focusing on data analytics. Cox adds there is a dire need for this 21st Century talent: from the startups all the way to Fortune 500 companies.

“Given the huge demand and low supply for data scientists and data analysts, there is a definite sense of urgency for this Initiative,” says Cox. “It’s mission critical for

CCI BUSINESS PARTNERS PROGRAM

The CCI Business Partners Program fosters mutually-beneficial collaborative relationships between the College of Computing and Informatics at UNC Charlotte and select businesses. The relationships and support provided by CCI Business Partners contribute greatly to CCI’s continued growth in relevant and emerging technologies, while providing the most effective quality education for our students. In return, businesses have access to a flexible portfolio of benefits for engaging with our students and faculty.

For more information:
Maryalicia Johnson
CCI Business Partners Program Director
Maryalicia@uncc.edu
companies to not only capture reliable data but fully understand the intelligence and insight it can offer."

Cox says the Initiative will bring greater visibility to our technology community. She says it will draw attention to the research and technology capabilities offered in Charlotte and create a hub, if you will, to bring together the best and brightest of data science and business analytics. Cox says it will also help to inspire innovative business models in the entrepreneurial community.

"The larger companies are finally getting it," says Cox. "And it is starting to come downstream as more and more young companies are seeing how they can leverage analytics to their advantage. It's all very exciting."
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Title: S-STEMS: STRS Leadership Corps Computing Scholars: Pathways from Community College to Graduate School thru T
PI: Chen, Keh-Hsun
Co-PI: Chu, Bill; Ribarsky, William
Sponsor: NSF
Period: 3/1/10 – 2/28/15
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PI: Du, Xiuxia
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PI: Shin, Min
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Period: 9/1/12 – 8/31/15
Award Value: $499,981

Title: S12-SSE: Reducing the Complexity of Comparative Genomics with Online Analytical Processing
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Sponsor: NSF
Period: 04/01/14 – 03/31/17
Award Value: $443,535

Title: CyberSEES: Enabling Sustainable Civil Infrastructure Using Interactive Formal Analytics
PI: Al-Shaer, Ehab
Sponsor: NSF
Period: 10/1/13 – 9/30/15
Award Value: $563,000
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<td><strong>Title: VASA: Visual Analytics for Security Analysis</strong></td>
<td>Ribarsky, Martin</td>
<td>Purdue</td>
<td>7/1/12 - 906/30/15</td>
<td>$308,360</td>
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<td><strong>Title: Big-Data Visual Customer Analytics for Identifying Emergent Business Competitive Advantages</strong></td>
<td>Ribarsky, Martin</td>
<td>Lowe's Companies, Inc.</td>
<td>12/16/13 - 02/16/15</td>
<td>$298,117</td>
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<td><strong>Title: Understanding the Complexity of the Transcriptomes in E. Coli K12</strong></td>
<td>Su, ZhengChang</td>
<td>NIH</td>
<td>06/01/14 - 03/31/15</td>
<td>$276,521</td>
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<td><strong>Title: CSR: Small Collaborative Research: Collaborative Overlay Problem Diagnosis Using Evidential Reasoning and Adaptation</strong></td>
<td>Al-Shaer, Ehab</td>
<td>NSF</td>
<td>9/1/10 - 8/31/15</td>
<td>$250,000</td>
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<td><strong>Title: NeTS: Small Collaborative Research: Enabling Network Agility Through Virtualized Infrastructure Migration</strong></td>
<td>Al-Shaer, Ehab</td>
<td>NSF</td>
<td>9/1/13 - 8/31/16</td>
<td>$249,999</td>
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<td><strong>Title: TWC: Small Collaborative: Discovering Software Vulnerabilities Through Interactive Static Analysis</strong></td>
<td>Lipford, Heather</td>
<td>NSF</td>
<td>10/1/13 - 9/30/16</td>
<td>$249,112</td>
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<td><strong>Title: Antibody Fragment Stability: A Focus on Domain-Domain Interactions</strong></td>
<td>Livesay, Dennis</td>
<td>MedImmune, LLC</td>
<td>9/15/11 - 9/30/14</td>
<td>$231,660</td>
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<td><strong>Title: NeTS: Small Collaborative Research Towards Reliable, Energy-Efficient, and Secure Vehicular</strong></td>
<td>Al-Shaer, Ehab</td>
<td>NSF</td>
<td>1/1/14 - 12/31/16</td>
<td>$229,357</td>
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<td><strong>Title: Collaborative Research: IUCRC Center for Configuration Analytics and Automation</strong></td>
<td>Al-Shaer, Ehab</td>
<td>NSF</td>
<td>6/1/2013 - 5/31/2018</td>
<td>$224,550</td>
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</table>

*ACTIVE GRANTS*

College of Computing and Informatics
Title: UNC Charlotte GAANN Fellowship in Computing and Informatics  
**PI:** Raja, Anita  
**Sponsor:** Department of Energy  
**Period:** 8/16/13 – 8/15/16  
**Award Value:** $223,620

Title: Capacity Building: Collaborative Research: Integrated Learning Environment for Cyber Security  
**PI:** Wang, Weichao  
**Sponsor:** NSF  
**Period:** 9/15/13 – 8/31/16  
**Award Value:** $215,241

Title: Understanding the Mechanism of Social Network Influence in Health Outcomes Through Multidimensional and eMan  
**PI:** Wu, Xintao  
**Sponsor:** Univ. of Oregon  
**Period:** 5/1/13 - 2/28/15  
**Award Value:** $203,157

Title: Visualization and Analysis of the Emergence, Evolution, and Spread of Pathogens  
**PI:** Janies, Daniel  
**Sponsor:** Ohio State University Research Foundation  
**Period:** 12/11/13 - 01/02/15  
**Award Value:** $201,235

Title: Building BRIDGES within the Undergraduate Major in Computer Science  
**PI:** Subramanian, Kalpathi  
**Co-PIs:** Payton, Jamie; Gool, Kasian  
**Sponsor:** NSF  
**Period:** 8/1/2013 - 7/31/16  
**Award Value:** $193,813

Title: CR: ABI Innovation: Towards High Performance Flexible Transcription Factor-DNA Docking  
**PI:** Guo, Jun-tao  
**Sponsor:** NSF  
**Period:** 08/01/14 – 07/31/17  
**Award Value:** $185,699

Title: Collaborative Research: Supporting Secure Programming Education in the IDE  
**PI:** Lipford, Heather  
**Co-PI:** Chu, Bill  
**Sponsor:** NSF  
**Period:** 8/15/11 - 2/28/15  
**Award Value:** $183,589

Title: Diet, Obesity, and the Etiology of Diverticulosis.  
**PI:** Fodor, Anthony  
**Sponsor:** UNC Chapel Hill  
**Period:** 4/1/12 - 3/31/15  
**Award Value:** $177,128

Title: Cardiovascular Research Grid – Imaging Informatics  
**PI:** Ge, Yaorong  
**Sponsor:** Vanderbilt University  
**Period:** 7/1/13 - 11/30/14  
**Award Value:** $161,492

Title: New Site of I/UCRC Safety, Security, and Rescue Research Center  
**PI:** Xiao, Jing  
**Co-PI:** Akella, Srinivas  
**Sponsor:** NSF  
**Period:** 6/1/2013 - 5/31/2018  
**Award Value:** $160,000

Title: Modeling and Analysis of Gene Duplication  
**PI:** Schlueter, Jessica  
**Sponsor:** University of Wyoming  
**Period:** 8/14/12 - 6/30/16  
**Award Value:** $150,084

Title: Analyzing and Depicting Social Media through Signal Metrics  
**PI:** Ribarsky, Martin  
**Sponsor:** ARO  
**Period:** 5/1/13 - 10/31/14  
**Award Value:** $150,000

Title: EAGER: Toward Automated Integration of Moving Target Defense Techniques  
**PI:** Al-Shaer, Ehab  
**Sponsor:** NSF  
**Period:** 10/1/13 - 9/30/15  
**Award Value:** $149,999

Title: CISE REU Evaluation Toolkit Expansion Project  
**PI:** Rorrer, Audrey  
**Sponsor:** NSF  
**Period:** 10/1/13 - 9/30/16  
**Award Value:** $149,999

Title: Growing the Science of Security Through Analytics  
**PI:** Al-Shaer, Ehab  
**Sponsor:** NC State University  
**Period:** 03/28/14 - 03/27/15  
**Award Value:** $144,823

Title: Forming an ACM Special Interest Group to Scale the Impact of BPC Activities  
**PI:** Souvenir, Jamie  
**Sponsor:** NSF  
**Period:** 09/15/10 - 08/31/15  
**Award Value:** $144,648

Title: Predictive Analyitics Visual Analytics User Experience  
**PI:** Ribarsky, Martin  
**Sponsor:** Purdue University  
**Period:** 09/09/13 - 02/15/15  
**Award Value:** $125,000
Title: TRPGR SoyMap II: Leveraging Untapped Genetic Diversity in Soybeans
Pl: Schlueter, Jessica
Sponsor: University of Georgia Research Institute
Period: 10/1/11 – 2/28/15
Award Value: $104,222

Title: A Computational Model for Evaluating the Quality of Citizen Science Contributions
Pl: Maher, Mary
Sponsor: NSF
Period: 09/01/14 – 08/31/15
Award Value: $97,300

Title: Collaborative Research: Teaching Multi-Core and Many-Core Programming at a Higher Level of Abstraction
Pl: Wilkinson, Anthony
Sponsor: NSF
Period: 8/15/12 – 7/31/15
Award Value: $89,942

Title: Air-Polution Exposure-Health Effects Indicators: Mining Massive Geographically Referenced Environmental Heath Data
Pl: Yang, Jing
Sponsor: Texas State University San Marcos
Period: 02/01/11 – 01/31/15
Award Value: $85,590

Title: Autonomous Perception and Manipulation in Search and Rescue
Pl: Xiao, Jing
Sponsor: NSF
Period: 08/15/14 – 07/31/16
Award Value: $80,000

Title: Robots and Sensors for the Well-being
Pl: Xiao, Jing
Sponsor: NSF
Period: 09/15/14 – 08/31/19
Award Value: $65,000

Title: RCN-SEES: Predictive Modeling Network for Sustainable Human-Building Ecosystems (SHBE)
Pl: Tolone, William J.
Sponsor: Univ. of N. TX
Period: 9/1/13 – 8/31/18
Award Value: $62,500

Title: An Infection Risk Model for Predicting a Patient’s Risk of Developing CRE Infection
Pl: Fodor, Anthony
Sponsor: CHS
Period: 07/01/14 – 06/30/16
Award Value: $60,000

Title: EAGER: Data Analysis for Nursing Care Assistance
Pl: Xiao, Jing
Sponsor: NSF
Period: 9/1/12 – 8/31/15
Award Value: $55,389

Title: Research, Training, and Personnel Support in Data Science and Advanced Analytics
Pl: Tolone, William J.
Sponsor: UNC GA
Period: 9/27/13 – 8/31/15
Award Value: $55,080

Title: Third Party Application Policy Management in Social Networks
Pl: Shehab, Mohamed
Sponsor: Google, Inc.
Period: 9/1/11 – 8/31/15
Award Value: $55,000

Title: I-Corps Team: Commercialization of Video Collaboratory
Pl: Latulipe, Celine
Sponsor: NSF
Period: 10/15/13 – 6/30/15
Award Value: $50,000

Title: Role of Bacteria in Colitis-Associated Colon Cancer
Pl: Fodor, Anthony
Sponsor: University of Florida
Period: 07/01/13 – 03/31/15
Award Value: $49,980

Title: Collaborative Research: RGN: Integrative Pollen Biology
Pl: Loraine, Ann
Sponsor: NSF
Period: 9/1/11 – 8/31/15
Award Value: $46,907

Title: Regulation of Floral Growth and Patterning in Arabidopsis Thaliana
Pl: Loraine, Anne
Sponsor: University of South Carolina
Period: 05/01/14 – 04/30/15
Award Value: $36,060

Title: Searchable Repository of Resilience and Sustainability Technologies
Pl: Zadrozny, Wlodek W.
Sponsor: University of North Carolina at Chapel Hill
Period: 01/02/14 – 12/31/14
Award Value: $30,000

Title: Collaborative Research: Special Projects (CNS): BPC-A: Expanding Computing Education Pathways
Pl: Souvenir, Jamie
Sponsor: GA Institute of Technology
Period: 10/1/12 – 9/30/17
Award Value: $24,472
<table>
<thead>
<tr>
<th>Title</th>
<th>PI</th>
<th>Sponsor</th>
<th>Period</th>
<th>Award Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Using Harvestmen to Study the Geologic, Climatic, and Biological History of the Phillipines</strong></td>
<td>Clouse, Ronald</td>
<td>NGS</td>
<td>12/01/13 – 11/30/14</td>
<td>$16,310</td>
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<tr>
<td><strong>Collaborative Research: Special Projects (CNS): BPC-A: Expanding Computing Education Pathways</strong></td>
<td>Souvenir, Jamie</td>
<td>GA Institute of Technology</td>
<td>10/1/12 – 9/30/17</td>
<td>$24,472</td>
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<tr>
<td><strong>Desensitization of Cone Visual Signaling Pathways</strong></td>
<td>Du, Xiuxia</td>
<td>UNC Chapel Hill</td>
<td>4/1/12 – 3/31/15</td>
<td>$16,308</td>
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<tr>
<td><strong>NCWIT Extension Services for Undgraduate Programs (ESUP)</strong></td>
<td>Maher, Mary</td>
<td>Stevens Institute of Technology</td>
<td>11/19/13 – 03/31/15</td>
<td>$8,000</td>
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<tr>
<td><strong>Expansion of the University of North Carolina System-Wide Professional Science Master’s (PSMs)</strong></td>
<td>Akella, Srinivas</td>
<td>NC State University</td>
<td>2/1/12 – 11/30/14</td>
<td>$6,000</td>
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<tr>
<td><strong>Parsing, Searching, and Reasoning in Large-Scale Medical Image Database</strong></td>
<td>Zhang, Shaoting</td>
<td>Oak Ridge, Associated Universities</td>
<td>06/01/14 – 05/31/15</td>
<td>$5,000</td>
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<tr>
<td><strong>Densifying Sparse Computation for Efficient GPU Execution</strong></td>
<td>Saule, Erik</td>
<td>NVIDIA</td>
<td>5/1/14 – 4/30/15</td>
<td>$1,489</td>
</tr>
</tbody>
</table>
STAFF

Yi Deng, Ph.D.
Dean

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Interim Associate Dean for Undergraduate Programs

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Affiliation: Department of Bioinformatics and Genomics
Education: Ph.D, Washington University in St. Louis (2005)
http://www.du-lab.org/
<table>
<thead>
<tr>
<th>Name</th>
<th>Position/Title</th>
<th>Affiliation/Department</th>
<th>Education/Institution</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jianping Fan, Ph.D.</td>
<td>Professor</td>
<td>Department of Computer Science</td>
<td>Ph.D., Chinese Academy of Sciences (1997)</td>
<td><a href="http://www.cs.uncc.edu/~jfan/">http://www.cs.uncc.edu/~jfan/</a></td>
</tr>
<tr>
<td>Anthony Fodor, Ph.D.</td>
<td>Associate Professor</td>
<td>Department of Bioinformatics and Genomics</td>
<td>Ph.D., University of Washington (1998)</td>
<td><a href="http://www.fodor.net/">http://www.fodor.net/</a></td>
</tr>
<tr>
<td>James Frazier</td>
<td>Assistant Chair and Director of Freshman Programs</td>
<td>Department of Computer Science</td>
<td>JD, UNC Chapel Hill</td>
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</tr>
<tr>
<td>Yaorong Ge, Ph.D.</td>
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<td>Ph.D., Vanderbilt University (1995)</td>
<td><a href="http://www.cs.uncc.edu/">http://www.cs.uncc.edu/</a></td>
</tr>
<tr>
<td>Yong Ge, Ph.D.</td>
<td>Associate Professor</td>
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</tr>
<tr>
<td>John Gero, Ph.D.</td>
<td>Research Professor</td>
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<td><a href="http://mason.gmu.edu/~jgero">http://mason.gmu.edu/~jgero</a></td>
</tr>
<tr>
<td>Cynthia Gibas, Ph.D.</td>
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</tr>
<tr>
<td>Jun-tao Guo, Ph.D.</td>
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<td>Ph.D., University of Kentucky (2001)</td>
<td><a href="http://guolab.uncc.edu/members/jgtu4">http://guolab.uncc.edu/members/jgtu4</a></td>
</tr>
<tr>
<td>Mirsad Hadzikadic, Ph.D.</td>
<td>Director, Complex Systems Institute</td>
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<td><a href="http://ccisweb.uncc.edu/~mirsad/">http://ccisweb.uncc.edu/~mirsad/</a></td>
</tr>
<tr>
<td>Richard Ilson</td>
<td>Lecturer</td>
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<td>M.S., MIT (1980)</td>
<td><a href="http://coitweb.uncc.edu/~rilson/">http://coitweb.uncc.edu/~rilson/</a></td>
</tr>
<tr>
<td>Daniel Janies, Ph.D.</td>
<td>The Carol Grotnes Belk Distinguished Professor of Biocomputing</td>
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<td>Ph.D., University of Florida (1995)</td>
<td><a href="http://webpages.uncc.edu/~dkjanies">http://webpages.uncc.edu/~dkjanies</a></td>
</tr>
<tr>
<td>Anthony Kombol</td>
<td>Lecturer</td>
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<td>University of Iowa (1980)</td>
<td><a href="http://www.cs.uncc.edu/~akombol/">http://www.cs.uncc.edu/~akombol/</a></td>
</tr>
<tr>
<td>Celine Latulipe, Ph.D.</td>
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<td><a href="http://web.me.com/ceinelatulipe/Home/ceinelatulipe.html">http://web.me.com/ceinelatulipe/Home/ceinelatulipe.html</a></td>
</tr>
<tr>
<td>Lorrie Lehman</td>
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<td>Department of Computer Science</td>
<td></td>
<td><a href="http://coitweb.uncc.edu/~lorrie/">http://coitweb.uncc.edu/~lorrie/</a></td>
</tr>
<tr>
<td>Richard Lejk, Ph.D.</td>
<td>Associate Professor</td>
<td>Department of Computer Science</td>
<td>Ph.D., Probability and Statistics, Texas A&amp;M University (1967)</td>
<td><a href="http://coitweb.uncc.edu/~rl/">http://coitweb.uncc.edu/~rl/</a></td>
</tr>
</tbody>
</table>
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Affiliation: Department of Bioinformatics and Genomics
Education: Ph.D., Genetics, Iowa State University (2006)
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Position: Data Scientist
Affiliation: Data Science and Business Analytics Initiative
Education: Ph.D., Bioinformatics and Computational Biology, Iowa State University

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Position: Lecturer
Affiliation: Department of Computer Science
Education: M.S., Georgia State University

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Position: Professor and Associate Dean
Affiliation: Department of Bioinformatics and Genomics
Education: Ph.D., Cellular, Viral, and Molecular Biology, University of Utah Medical Center (1987)

Wei Sha
Research Assistant Professor
Department of Bioinformatics and Genomics

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Position: Associate Professor
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http://liisp.uncc.edu/~mshehab/

Mindy Shi, Ph.D.
Position: Assistant Professor
Affiliation: Department of Bioinformatics and Genomics
Education: Ph.D., Computer Science, University of Chicago
http://shilab.uncc.edu/

Min Shin, Ph.D.
Position: Associate Professor
Affiliation: Department of Computer Science
Education: Ph.D., Computer Science & Engineering, University of South Florida (Aug 2001)
http://fcl.uncc.edu/mcschin/

Richard Souvenir, Ph.D.
Position: Associate Professor
Affiliation: Department of Computer Science
http://www.cs.uncc.edu/~souvenir/

Meera Sridhar, Ph.D.
Position: Assistant Professor
Affiliation: Department of Software and Information Systems
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