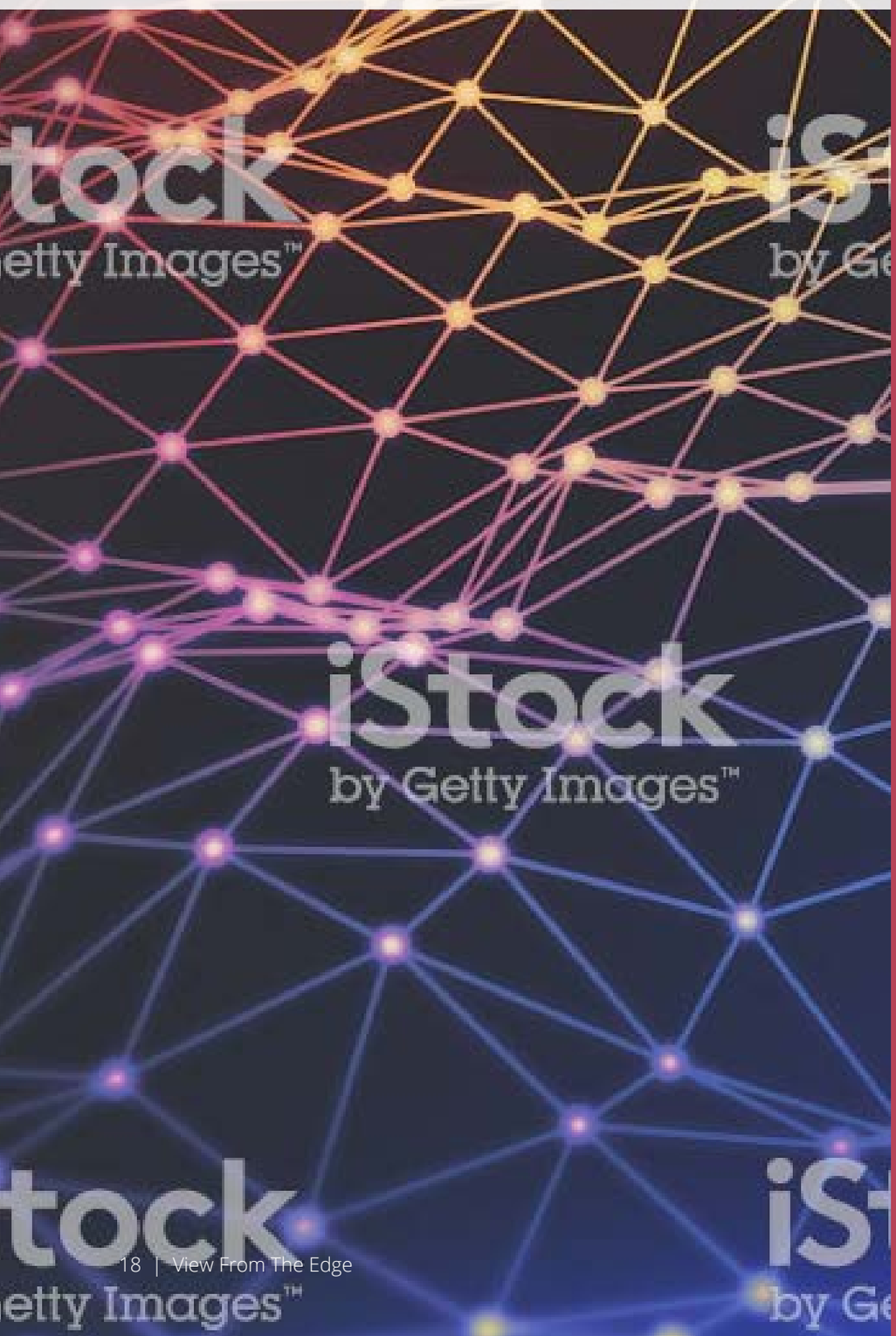
NJ Big Data Alliance

GRASSROOTS EFFORTS BENEFIT ACADEMIA AND INDUSTRY IN THE STATE



Life can easily become overwhelming with the amount of information flowing through our lives. Data comes from a wide variety of sources, including business, individual, and industry activities, as well as the natural environment. The data gathered can be transformative. However, to create value, this data needs to be analyzed in a way that can generate information that is useful. This requires analytics expertise and the advanced computing equipment that can process huge amounts of data.

The New Jersey Big Data Alliance (NJBDA) was established to enable this transformation to happen.

"Academia, industry and government have access to large volumes of data but often lack the analytical expertise and technical capabilities to fully utilize it," said Dr. Peggy Brennan-Tonetta, President and Co-founder of the NJBDA and Associate Vice President for Economic Development at Rutgers University. "Data that is appropriately analyzed contributes greatly to exploring new discoveries that can benefit society and is vital for competitive economic growth."

What is Big Data?

Big Data refers to extremely large data sets, as well as the technologies, people, and processes that allow for its collection, storage, and analysis. Computational analysis of the data enables companies to extract new insights (such as revealing patterns and trends) and create new forms of value.

The NJBDA was established in 2013 by Rutgers University, along with six higher education partners, to build advanced computation capabilities and expertise to leverage, analyze, and protect big data.

The NJBDA currently has 17 higher education members across New Jersey. One of the organization's overall goals is to identify areas of synergy in advanced computation and data analytics, while developing joint partnerships, curriculum and programs

across multiple spectrums. The NJBDA also serves as New Jersey's education, research, and outreach consortium in advanced computation and big data. The collaboration amongst New Jersey academia, industry, and government increases competitiveness and improves the ability to drive innovation and secure federal funding to support critical research.

Birth of the NJBDA in the State

Brennan-Tonetta is a co-founder of the NJBDA. Her role as the Associate Vice President for Economic Development at Rutgers, where she focuses on developing large-scale economic development initiatives, provided the opportunity to establish the NJBDA. She has a strong track-record in taking the expertise and resources found at the University, collaborating with others, and developing programs that impact New Jersey communities and industry sectors.

In 2013, Brennan-Tonetta worked with Rutgers distinguished professor of computer science, Dr. Manish Parashar, to establish the NJBDA. The impetus was state bond funding received by the Rutgers Discovery Informatics Institute, led by Parashar, to purchase the state's first supercomputer. "We recognized that for New Jersey industry and academia to remain competitive, capabilities in advanced computing needed to be dramatically increased," she said. Parashar and Brennan-Tonetta felt this valuable new resource funded by the state should be made available to academia and industry throughout New Jersey. "We wanted the supercomputer to be a state resource," Brennan-Tonetta said. The Rutgers Discovery Informatics Institute, which is New Jersey's center for advanced computing, houses the New Jersey supercomputer known as *Caliburn*.

In order to enable sharing of advanced computing capabilities and further develop the state's capabilities in big data, the New Jersey Big Data Alliance was created. The organization is a collaboration of universities, government and industry from around New Jersey, all who recognize the importance of big data. "The inspiration behind this activity was the supercomputer and making it available to other institutions," Brennan-Tonetta said. "At the same time, we saw the tremendous need for expanding expertise and advanced computing technologies. We felt it was important that academic institutions work together to pool our resources so we could become a major presence and an asset for the state of New Jersey." Brennan-Tonetta said.

> We have a very service-oriented mindset," Brennan-Tonetta said. "We're here to serve the state and we're here to serve industry. We've built a really strong community around big data."
>
> **PEGGY BRENNAN-TONETTA**
> President and Co-founder of New Jersey Big Data Alliance and Associate Vice President for Economic Development at Rutgers University.

A unique aspect of this organization is that the formation of the NJBDA was a grass-roots effort, with universities working and collaborating towards a common goal. The state legislature recognized the value of the NJBDA and in 2014 designated the NJBDA as "New Jersey's advanced cyberinfrastructure consortium."

Initially, the group began as six universities. Today, there are 17 universities, as well as other like-minded organizations such as NJEdge.

The NJBDA has an official memorandum of agreement that lays out the roles and responsibilities of the members. The document addresses items such as intellectual property issues and equipment ownership.

"The memorandum addresses all the issues one would think of when universities have to collaborate," Brennan-Tonetta said. "One of the most monumental things about the memorandum is that all 17 universities signed it and agreed with the process."

The NJBDA In Action

The NJBDA is open to industry membership and there are currently four industry members. New members are always welcome! A recent industry survey revealed the difficulty many companies have in finding the skilled workforce they need. In response to this, the NJBDA Industry and Affiliate Member Committee organized a Workforce Forum on November 14 at Rider University where a wide variety of industries were in attendance.

NJBDA Committees

Government Committee

Responsible for government relations and outreach to legislators, government members and other agencies to provide information about the NJBDA and the services it can offer to the state.

Marketing and Outreach Committee

Responsible for marketing the NJBDA, preparing press releases, developing marketing materials, maintaining the website and social media activities, representing the organization at tech affiliated events throughout the state.

Technology Committee

Responsible for developing an inventory of advanced computing technologies at all of the member institutions, creating a database of these assets and contributing this information to the new state database "Research with New Jersey" (see **www.researchwithNJ.com**), and hosting technical workshops at the annual symposia (Python, etc.).

Academic Member Committe

Responsible for facilitating partnerships among academic members and recruiting new universities looking to join the alliance.

Industry and Affiliate Member Committee

Responsible for recruiting and engaging industry and affiliate members in the activities of the NJBDA and developing programs that address the challenges industry face in big data.

Education and Training Committee

Responsible for developing training workshops, career fairs, and working with school districts to develop curriculum in data science for students.

Research Collaborations Committee

Responsible for facilitating research collaborations amongst members by identifying areas of interest and federal funding opportunities.

Representatives of these companies shared their workforce challenges and needs in the areas of data science and advanced computing. The NJBDA will take this information and develop programs in partnership with industry to address these needs.

The NJBDA has also become a resource to the state. For instance, when the Business Action Center is looking to retain a company or recruit a company to New Jersey, they can point to the NJBDA and demonstrate that universities are working together in big data, which is a big attraction.

Several New Jersey government agencies have joined the alliance as ad hoc members, including the Business Action Center, Economic Department Authority, New Jersey Department of Labor and Workforce Development, Office of Information Technology, Atlantic County Utilities Authority and nonprofit Choose NJ. "We're really excited about the potential of the alliance to partner with our government members and help them in their efforts to drive economic development in New Jersey," Brennan-Tonetta said.

There are seven active committees in the NJBDA, and the work is carried out based on all volunteer time. The NJBDA pursues a broad range of activities from education and training to research collaborations. They also host an annual symposium that focuses on opportunities and challenges in big data. The annual event draws over 200 attendees. The Sixth Annual NJBDA Symposium will take place on April 5, 2019 at New Jersey City University. The theme will be *The Future of Big Data: AI and Machine Learning.*

"It is incredible to work with a volunteer organization with the level of commitment from its members as the NJBDA," Brennan-Tonetta said.

In 2018, members of the NJBDA's Education and Training Committee organized the first-ever statewide Data Sciences Career Fair with 20 different companies and students from member

universities. There are hopes to make the event larger in 2019.

“The Data Sciences Career Fair was considered a successful event by both students and the industry sector. Of particular value to the industry participants was access to students from many universities. Students found value in being able to come to an event with a specific focus on data analytics,” Brennan-Tonetta said.

One change taking place for 2019 is the event timeframe. Last year, the career fair was held in conjunction with the annual symposium in April. In 2019 and into the future, the event will be held in January because the timing works better in terms of the hiring cycle of companies and the job search activities by students.

There are other ways the NJBDA is positioning itself to advance the big data, analytics, and compute agenda in New Jersey. Universities such as Rutgers with its supercomputer or Rowan University with a virtual reality facility make these resources available to academia, industry and government and provide the expertise needed to utilize the varied resources.

“We have the expertise on how to use the equipment,” Brennan-Tonetta said. “We also provide training to students on cutting edge systems. When they graduate, they find these skills are in huge demand." Companies across every sector are having difficulty filling positions that require higher level technical and analytics skills. "There's such a massive demand for data science graduates,” Brennan-Tonetta said. “We’re really committed to New Jersey, so we’re providing companies with access to highly skilled people within the state and helping them to grow.”

In terms of academia, the faculty are committed to working together. Each university brings different expertise to the table. For instance, there may be schools not as strong in technology but that have really great curriculum. “Making each other aware of what we have to offer has been so valuable,” she said. “Prior to the NJBDA, we had limited knowledge regarding the expertise, resources and curriculum at each other's universities. But by working together and sharing our information, we’re now aware of what everyone has to offer and can create synergy. The sharing of information and active collaboration has been so valuable."

One organization the NJBDA works closely with is NJEdge, as they collaborate on projects and areas of interest. NJEdge also provides the Internet backbone for the NJBDA, playing a critical part for all of the institutions. NJEdge’s Dr. Edward Chapel currently serves as the NJBDA’s secretary and was a part of the founding group back in 2013.

“Ed has an interest in the NJBDA being a community of practice around big data,” Brennan-Tonetta said. “This structure is something we’re also interested in, so working together with NJEdge to accomplish common goals is what the NJBDA is all about."

The NJBDA is always looking for ways to partner with academia and industry in the state, whether it's academic institutions or companies interested in joining. “We have a very service-oriented mindset,” Brennan-Tonetta said. “We’re here to serve the state. We've built a really strong community around big data.”

The NJBDA is one of the state’s hidden gems collaborating with academia, government and industry in data analytics and computation to create future economic growth opportunities in New Jersey. For more informationon the New Jersey Big Data Alliance, visit: **www.njbda.org**. Brennan-Tonetta can be contacted at mbrennan@njaes.rutgers.edu.