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# VINUNIVERSITY PROJECT

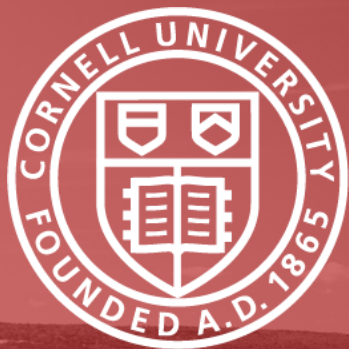
1 | Industry - Academic Thought Leadership Roundtable | 2019 Report

# INTERDISCIPLINARY INNOVATION

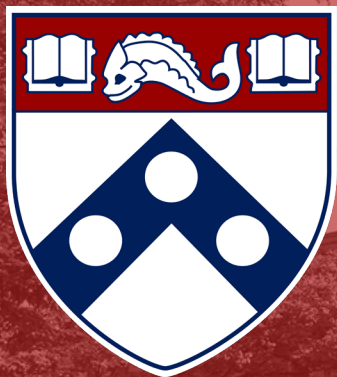
Hanoi - April 3, 2019



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UNIVERSITY of PENNSYLVANIA

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# ROUNDTABLE EXECUTIVE SUMMARY

In April 2019, VinUniversity Project organized the first industry-academic thought leadership roundtable, empowered by Cornell University and University of Pennsylvania. The roundtable brought together academic experts and senior industry leaders to share ideas and develop thought-provoking insights to guide future academic endeavors and practices. Furthermore, this forum helps nurture the relationship between VinUniversity and Industry, leading to meaningful engagement and future collaborations. During the roundtable, academic scholars and industry executives shared examples on the featured topic: Interdisciplinary Innovation. They discussed ideas for industry and academia to collaborate to foster innovation.



“VinUniversity is positioned in a way to enable unique, interdisciplinary ideas, by taking advantage of synergies between Engineering and Computer Science and the other schools at VinUni. Interdisciplinary connections between the programs and between faculty is important. Consideration can be given to interdisciplinary minors, research, start-ups, and industry collaborations.”

Mark Campbell, PhD  
Cornell University

# STATISTICS

**21**

**TOP INDUSTRY  
EXECUTIVES**

**29**

**ACADEMIC  
PROFESSIONALS**

**“It was a very open and insightful roundtable that was well organized and facilitated.”**

**“Great opportunity to exchange ideas with industry and academics.”**

**“I gained insights from top academics and learned about opportunities to cooperate.”**

**BUSINESS**

**HOSPITALITY**

**REAL ESTATE**

**7**

**SECTORS**

**MEDICINE**

**NURSING**

**ENGINEERING**

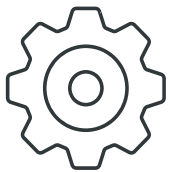
**COMPUTER SCIENCE**

# EXAMPLES OF INTERDISCIPLINARY INNOVATION

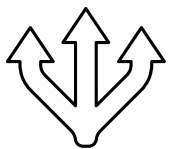
## ENGINEERING AND COMPUTER SCIENCE



**Self-driving car:** using advanced car automation technology and learning software developed by computer scientists.

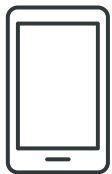


**Robotics:** with robot and automation software; having large application in manufacturing and warehouse management. For example, robots at VinFast factories, Kiva robots at Amazon warehouses, or Exyn autonomous aerial robots for advanced data collection.



**Auto-adjusted traffic management systems:** FPT AI-powered traffic lights in Hanoi and Ho Chi Minh City, equipped with sensors, cameras, and GPS, to collect data, predict congestion, and auto-adjust time to reduce congestion.

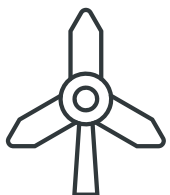
## ENGINEERING, COMPUTER SCIENCE, AND HEALTH SCIENCE



**Mobile-device-based diagnostic platform:** with medical device, mobile app, and health science data. For example, NutriPhone, a point-of-care diagnostic for assessment of nutritional status.



**Breakthrough in cancer treatment:** with engineering, big data, medical and pharmaceutical expertise. For example, a leukemia treatment by weaponizing a patient's own blood via re-engineered cells to combat the cancer cells. The patient has now been cancer-free for seven years. This breakthrough technology has led to curing thousands of people with cancer.

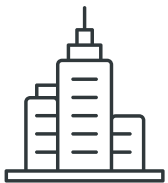


**Air quality monitoring system:** using internet of things and machine learning for real-time monitoring and emergency response to crisis. For example, tMonitor, the real-time indoor air quality monitoring system, powered by Watson IoT and Watson Machine Learning platforms.

## ENGINEERING, COMPUTER SCIENCE, AND REAL ESTATE



**Smart homes:** with home devices and systems powered by AI. For example, CASPAR.AI, smart properties that adapt to the residents, e.g., provide the elderly with customized nutrition, mobility, wellness services and amenities.



**Smart cities:** adding digital intelligence to existing urban systems to enhance urban life and to optimize urban planning. These digital solutions and tools can save time, reduce waste, increase mobility, prevent crime, and boost social connectedness. Cities that have the most developed technology bases: Singapore, New York City, Seoul, Stockholm, etc.

## COMPUTER SCIENCE AND EDUCATION



**Adaptive education platform:** using big data and AI to provide interactive educational content based on knowledge models. For example, with FPT Edu platform, students, parents, and teachers will be able to identify the exact strengths and weaknesses of students and focus on personalized learning for students. FPT's goal is to bring this platform to all K-12 schools, especially in remote/rural areas of Vietnam.

## COMPUTER SCIENCE AND AGRICULTURE



**Farm managing system:** using AI and remote sensing for managing agriculture farms. For example, IBM's sugarcane estates management system can check weather to inform the farm owner if there is an upcoming storm, and has HD-NDVI (normalized difference vegetation index) to monitor crop vigor through remote sensing satellites. Soil moisture can also be estimated as well as the quality of the soil. The system can provide data-driven insights for owners to make decisions, which affect yield, costs, revenue, and operational efficiency of the farms.

# IDEAS FOR INDUSTRY-ACADEMIA COLLABORATION TO FOSTER INTERDISCIPLINARY INNOVATION

- ▲ **University to build an ecosystem to move forward projects into industry.** It can start with forming “academic” incubators, such as the Pennovation Center at University of Pennsylvania and eLab at Cornell University. Besides making it easier for people to try out new ideas, it is important to create incentives (grants, awards, evaluation) for faculty and students to step out of their comfort zones and embrace interdisciplinary work. These accelerator facilities will enhance entrepreneurship programs and stimulate an entrepreneurial culture among faculty and students.
- ▲ **Academic institutions of higher learning should earnestly develop strategic partnerships and alliances with private and industry sectors.** These alliances should yield seed funding for research, pilot projects and spin-off start-ups, to engage faculty and students in solving real world problems.
- ▲ **Other collaborative models for the university to explore include:** creating student internships mentored by both faculty and company, enhancing the curriculum by bringing adjunct experts or guest speakers from industry to campus, conducting joint research projects between university and companies/organizations, establishing a consulting office for faculty and students doing consulting projects for companies, providing executive and leadership training to industry, creating lifelong learning programs for executives and professionals; and organizing seminars, workshops, and roundtables to share academic research and industry practices.
- ▲ **The IBM Academic Initiative is a self-service program that provides students and faculty at accredited academic institutions with access to select IBM resources at no charge for teaching, learning and non-commercial research.** Students will learn the skills in-demand for today’s job market and experiment with strategic technologies such as data analytics, block chain, cloud, artificial intelligence, security and more.

- ▲ **Creating impact in the country will require buy-in from the government sector.** It is important for the university to involve government counterparts, in addition to business counterparts, in research, projects, and co-curricular activities, etc. The university should focus on what is most meaningful in Vietnam while developing the projects, for example, health issues, poverty elimination, pollution reduction, etc. Also, the university can strengthen relations with the government by providing studies and reports, through high-level consulting/workshops for policy makers, and influencing policy making.
- ▲ **The university can also partner with corporations operating with CSR (corporate social responsibility) perspective to work on projects or initiatives that enhance the community.** This will help students experience the service learning model and address real world issues.

“In most cases, breakthrough innovation is the result of intensive interdisciplinary research and development. And the key of success is being open minded, bringing in colleagues from the industry, and finding solutions for real world problems.”

Rohit Verma, PhD  
Cornell University



“If the goal is to transform health care, medical education needs to also be transformed. We need breakthroughs in innovation; transformation in diagnosing, treating, and caring for patients; disruption in knowledge, skills, and attitudes.”

Lisa Bellini, MD  
University of Pennsylvania

# CONCLUSION

In summary, Engineering, Medicine, Nursing, Business, Technology, and Real Estate have several intersecting domains. Potential areas of collaborations are possible in clinical applications, education, community-based applications, and the home and environment. Another domain is urban development and making smart cities. Automation and robots are also on the rise. The humanitarian sector is also an important area of potential collaboration. Water sanitation, vaccine availability, limited transportation, and health care in rural areas are still major public health challenges.

It is important to have interdisciplinary collaboration among faculty and students, between academia and industry, involving government and community, in order to realize interdisciplinary innovations.

We look forward to continuing this roundtable series, delving into other important topics, such as: managing conflict of interest of different parties involved in interdisciplinary research/projects; and exploring models of interdisciplinary cooperation in academia or in industry, for example, funding/sponsorship from industry, intellectual property registrations, etc. We are also considering visiting participant companies to gain an understanding of the mission and vision of the companies, thereby leading to a more enriched discussion during the roundtable.

**See you at our next industry-academic thought leadership roundtable!**



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