



Strengthening
University-Industry
Partnerships



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UIDP Virtual 2020 CONFERENCE REPORT

March 23 – 26, 2020

Hosted by UIDP



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CONFERENCE AT A GLANCE

Rather than relinquishing victory to COVID-19 concerns, UIDP transitioned much of the content planned for our March 23-26 spring conference to a virtual event—[UIDPVirtual 2020](#). This online conference featured an agenda packed with curated topics and presented by an outstanding set of national thought leaders and academic and corporate practitioners.

UIDPVirtual 2020 allowed participants to access content from anywhere in the world. Attendees played an active role watching, listening, and interacting via live Q&A and interactive tools. Several project sessions were offered including: *Selling Excess Capacity*, *Bringing Industry Consulting in House*, *On-campus Opportunities for Industry Personnel and Structuring Corporate Engagement Activities*. The event also highlighted four federal program updates shared by government representatives from the National Institute for Standards and Technology (NIST) and the National Science Foundation (NSF). The UIDP was fortunate to secure the services of over 40 subject matter experts and over 350 participants from around the world took part in this event. Live presentations have been completed, and conference attendees can download materials and watch session recordings 24/7—whenever it is convenient for you.





DAY ONE

MONDAY – March 23, 2020

UIDP Academy Workshop Contemporary Contracting Approaches (Part 1 and 2)

Moderator: Sandy Mau, UIDP

Presenters: Elaine Brock, C3 Authority & UIDP • Jarrett Ellis, Georgia Tech • Jeff Fortin, Penn State University

Companies and universities are seeking better ways to strike collaborations between the sectors. There are several relatively new contracting approaches that have been adopted.

Takeaways:

- **Georgia Tech Contract Continuum:** Ga Tech contracting methodology is researcher driven and uses a 4-stage plan: Basic Investigations, Applied Investigation, Late Stage Improvement, and Testing and Evaluation.
- **Public Dedication IP models:** Industry sponsored research agreements that incorporate this condition require the inventor to waive right to foreground intellectual property emanating from the agreement. The UIDP has created a members-only Quick Guide on this topic, and it is accessible via the UIDP member portal.
- **University agreements for faculty consulting:** This approach is a tool that some universities use, and some don't, and there is a lot to consider if you choose to do this. There are benefits for the faculty members who use the university as the contract negotiator and companies who may have experience working with the university.
- **Selling Excess Capacity:** Universities possess resources that external organizations/companies may want to access. This can generate revenue for the university and help it advance its mission. Challenges arise when there is high demand for the facilities and external groups are competing with internal ones for access. Clear plans for how these situations will be handled will help prevent problems.

UIDP Academy Workshop: Perspectives on Advanced Corporate Affiliate Programs (CAP) (Part 1 and 2)

Moderator: Kristina Thorsell, UIDP

Presenters: Andrew Cockerill, UIDP • Todd Cleland, University of Washington • Cody Noghera, UC San Diego • Arturo Pizano, Siemens • Terri Deasy, CyLab

A handful of schools have created corporate affiliate programs through which companies pay a fee to gain access to students, colleges, or departments. A few programs are very successful, but there are many hurdles to consider when creating and maintaining programs. Companies also must weigh the cost against benefits: How do you determine whether to join? In what ways can you maximize the value from



participation? What metrics should you use to determine whether to continue engagement? The UIDP has created a members-only Quick Guide on this topic, and it is accessible via the UIDP member portal.

Takeaways:

- **Program Rationale:** Get clear on why you are creating a CAP program and what the goals are before beginning. Experience demonstrates that these are a stepping-stone to deeper engagement and not a money maker.
- **Company Considerations:** Companies should consider before joining a CAP: their leadership's support, value proposition, employee to champion the program, any additional resources.

New Directions – Input into Manufacturing USA's Future

Moderator: *Tony Boccanfuso, UIDP*

Presenter: *Mike Molnar, NIST*

A key challenge to restoring U.S. leadership in advanced manufacturing is addressing the so-called “missing middle” – the technical and business barriers of scaling-up (and speeding up) an innovative new material, process, or technology for robust production use. Manufacturing USA is a federally sponsored public-private partnership designed to accelerate U.S. innovation through applied research and advanced workforce skills development.

Takeaways:

- **Seeking feedback:** NIST is seeking feedback from the broader community on ways to strengthen its offerings to serve the Nation and interested parties can visit (<https://www.manufacturingusa.com/>) to provide feedback.
- **Manufacturing USA:** This program supports public-private partnerships to tackle grand challenges in manufacturing that no one organization can handle alone. Institutes and partners collaborate on major applied research and development and workforce projects across critical advanced manufacturing technology areas, like additive, digital, sensors, photonics, biopharmaceuticals, robotics and more and seek to engage all interested.

DAY TWO

TUESDAY – March 24, 2020

NSF Convergence Accelerator Program Update

Moderator: *Tony Boccanfuso, UIDP*

Presenter: *Doug Maughan, NSF*

The NSF [Convergence Accelerator Program](#) just issued a new RFP; the solicitation can be found [here](#). Douglas Maughan, who leads the program, gave an update on the program, and provided information



on how interested parties (companies, local and state governments, non-profits, and universities) can get involved.

Takeaways:

- **Industry Engagement:** NSF Convergence Accelerator is looking to engage with industry in partnerships for existing awards entering Phase 2 of the Accelerator program.
- **New Solicitation:** NSF Convergence Accelerator has an upcoming solicitation that all UIDP attendees can consider for possible participation.

Partnership Management and Research Administration: Organizational Design of University-Facing Industry Research Organizations (UFIRO)

Moderator: *Tony Boccanfuso, UIDP*

Presenters: *Chris Ramming, VMware • Gabriela Cruz Thompson, Intel*

This session considered how companies can leverage university-facing industry research organizations (UFIRO) to advance their innovation strategy. A UFIRO is a corporate organization specifically chartered to engage with academia on external research collaborations as an element of a broader innovation strategy. When a company begins to recognize external research interactions as a formal part of its innovation strategy, it will often create a research-oriented organization to engage with academia. This organization is generally distinct from but may interact with, other university-facing company functions, such as recruiting, corporate social responsibility, and diversity and inclusion. This organization is also generally distinct from the internal research group, although it may interact closely with an internal research group to advance its goals.

Takeaways:

- **Intel:** Intel has a Corporate Research Council that seeks expertise from many areas of the company and oversees the single PI engagements. The areas are Process/Market/and Opportunity Driven. There are 15 teams that have an allocated number of dollars each year with a portfolio of research engagements. New centers for 2020 or 2021 will focus on the following components: Processing Data, Securing Information and Programming Efficiency.
- **VMware:** The company employs a *Technical Champions* model that focuses on cultivating advocates within a business unit; interested parties are encouraged to develop a relationship with these technical champions if they wish to formally partner with the company.

Compliance, Foreign Influence, and Emerging Threats Against US-Funded IP

Moderator: *Roseann Luongo, Huron*

Presenters: *Jeremy Forsberg, UT Arlington • Scott McGaunn, FBI • Kevin Gamache, Texas A&M University*

There are increasing concerns over the potential influence of foreign states on U.S. academia and industry, particularly as it pertains to international collaborations in research. As the landscape evolves,

institutions will be increasingly pressured to provide full disclosure of foreign involvement at all levels of the organization and will face increased federal scrutiny. This session explored the issue of foreign influence and the impact it has on a multitude of moving parts at research institutions while providing best practices on how to manage foreign affiliations.

Takeaways:

- **Institutions are committed to international collaboration;** it is important to understand the nature of those collaborations.
- **Accountability and transparency** in disclosure of research resources and collaborations to agencies is critical. Agencies are increasingly interested in understanding how research is funded from all sources, including in-kind.
- The **trend for enforcement** for failure to disclose and double dipping, among other issues have become more serious over time and have included criminal actions.

Modeling the Front End of the Innovation Cycle using Machine Learning and Data Analytics: An Emergent Approach

Moderator: *Sandy Mau, UIDP*

Presenters: *Daniel Calto, Elsevier • Sven Rueddigkeit, PatentSight/LexisNexis*

The global corpus of research publications is huge, with over 3.5M articles published in 2019 alone. Similarly, patenting activity is at an all-time high. Yet all patents are not created equal. How can universities and companies navigate this vast information thicket? One approach is to use powerful analytical tools. These tools use semantic methods such as NLP and machine learning to machine-read the entire global corpus of research papers and patents, then use the resultant semantic fingerprints to map connections through the entire front end of the innovation cycle. This approach allows the visualization of large and complex data sets and the generation of simple metrics that allow benchmarking vs. peers and competitors. This presentation demonstrated a method to track granular research topics and understand global technology trends, which allows continuous technology horizon scanning and competitive intelligence gathering on competing universities and firms. Such topics can be refined to a high level of specificity, then traced through basic to applied research, and on to patenting and commercialization activity worldwide. This is an emergent method of analysis. One goal will be to get feedback from the attendees about whether this approach is valuable, and how it can be further enhanced.

Takeaways:

- **Research Trends:** Elsevier has accurately modeled about 100,000 topics in all areas of science and social science, calculated an indicator that measures the current momentum of a topic and correlates with funding, and can help institutions make more informed decisions about their investments in research.
- **USA:** Looking at a few of the US's most prominent topics, we can see these correlate with areas of research strength. Many topics can easily be linked with specific technologies and even



manufacturing capabilities. The US contributes to nearly 89,000 topics of the 97,000 topics pursued globally.

- **Globalization's Impact:** Yesterday traditional industries had established value trends, today with digitalization there are new globally interconnected ecosystems.

Public Funding and U-I Collaborations

Moderator: Kristina Thorsell, UIDP

Presenters: Andrew Cockerill, UIDP • Jim Martin, Mississippi State University • Chris Hewitt, BASF • Ivelina Metcheva, VCU

Building on the input and discussion at our last two meetings, we have initiated a project to develop a quick guide, "Public Funding Opportunities: Finding Best Practice to Secure Public Funding for Collaborative University-Industry Projects." This breakout session presented current findings around issues such as rationale for creating or joining, recruitment of members and sustainability.

Takeaways:

- **Industry Considerations:** Some key traits that industry look for from university partners: responsiveness, flexibility, expertise, possibly someone they already know. University looks for: Existing relationship, same strategic goals, company that understands limitations universities face, capabilities that complement each other.
- **Member Recruitment:** Programs need to effectively communicate capabilities as well as gaps; geographic matters and being close to a potential member can help. Finally, universities need to work with potential members on identifying an executive champion within the firm.
- **Aligning Interests:** When looking for the right partner, one should consider if there are similar R&D goals within the party's willingness to invest in the relationship.

DAY THREE

WEDNESDAY – March 25, 2020

Engineering Research Centers – Past, Present, and Future

Moderator: Tony Boccanfuso, UIDP

Presenter: Kon-Well Wang, NSF

During recent decades, the scientific and engineering community and the federal agencies have explored the potential of large-scale center-type research programs. It has been recognized that many of the most challenging and complex technical problems can only be addressed if researchers with diverse expertise combine their efforts and work across the boundaries between disciplines. The

National Science Foundation (NSF) Engineering Research Center (ERC) program is a flagship program in this regard.

Takeaway:

- **Gen-4 Centers:** Interested parties that want to learn more about the GEN-4 Engineering Research Centers should visit: <https://www.nsf.gov/div/index.jsp?div=EEC>

Multi-Party Agreements (Contracting)

Moderator: *Kristina Thorsell, UIDP*

Presenter: *Elaine Brock, C3 Authority & UIDP*

Multiparty agreements can be useful or required in some situations. This session reviewed some common scenarios, some challenges, and solutions to avoiding chaos and promoting harmony.

Takeaways:

- **No Standard Approach:** There are lots of ways to write multi-party agreements and they are each unique – typically used in situations that are too expensive for one party, and/or require expertise from multiple sources.
- **Clearly Define Terms:** As is the case with most contracts, they can be either simple or quite complex. They should jointly and clearly define SOW, each parties’ obligations to perform part of the SOW, each parties’ IP rights, what each party gives (money, materials, personnel), etc.
- **Importance of Advisory Board:** Add advisory structure to the agreement. An advisory committee can set rules or bylaws, required meetings, to make decisions about projects, alert of problems early, etc. To be successful, secure buy in from most important parties first, then send agreed upon draft to others.

Food and Companionship Enriching Life-Partnering with the Animal Health Industry

Moderator: *Sandy Mau, UIDP*

Presenter: *Lucas Huntimer, Elanco*

Elanco understand the powerful role healthy animals play in making lives better. As pets increasingly become important parts of our families, so too does the need to help them live longer, healthier, higher-quality lives. As the global population grows, so too will the need to meet the demand for safe, affordable food for all. Elanco’s partnership engine provides rapid evaluation of external opportunities for both Companion and Food Animals.

Takeaways:

- Who Elanco is.
- What the animal health industry is.
- Typical partnering structures with our industry.



NSF Engineering Update

Moderator: Tony Boccanfuso, UIDP

Presenter: Dawn Tilbury, NSF

The talk presented an overview of NSF's 10 Big Ideas and describe some of the funding opportunities. There was also a summary of the activities of the Engineering Directorate, highlights of new cross-cutting programs at NSF, and Q&A.

Takeaways:

- NSF recently released a solicitation on Future Manufacturing and has committed \$40M in FY2020 to this effort.
- NSF will issue another solicitation to establish Quantum Leap Centers and is actively seeking industry participation.
- NSF will create an Engineering Research Visioning Alliance to help it identify bold and high impact research priorities; a solicitation is currently available.

On Campus Opportunities for Industry Personnel

Moderator: Tony Boccanfuso, UIDP

Panelists: Bob Starbuck, UIDP • Geanie Umberberger, Purdue University

There are numerous opportunities for industry personnel to share their expertise in academia. This session provided an overview of a recently launched UIDP project that seeks to capture and catalog the various opportunities available and communicate the possible benefits for employees, employers, and universities.

Takeaways:

- Engage industry personnel can help universities help achieve their chief responsibilities of education, research, and service.
- There are numerous roles that industry personnel (employed or retired) can perform in universities.
- The performance of these roles benefits the industry person, the company, the university, and the university students and faculty.

Federal Income Tax Credits Available to Industry for Payments to Universities and Other Organizations for Research Services

Moderator: Elaine Brock, C3 Authority & UIDP

Presenters: Loren M. Opper, Miller Canfield • Ryan J. Riehl, Miller Canfield

Congress incentivized corporate businesses to pay universities and other tax-exempt organizations to perform basic research for corporate businesses. The incentive is in the form of enhanced federal



income tax credits measured by payments for basic research. Federal income tax credits also are available to business taxpayers that contract with universities and other tax-exempt organizations to perform applied research. The differences between the two credits was explained, and an example of the method to calculate the basic research credit was provided. Emphasis was placed on a discussion of the basic research credit.

Takeaways:

- **Three categories of tax credits are available.** These include, cash payments to "qualified organizations" for basic research (e.g. universities,) money and property contributed for "qualified (applied) research," and contributions to an "energy consortium" to conduct energy research in the public interest.
- **There are IRS challenges to the research credit.** The IRS uses substantial resources to examine taxpayers who claim the qualified (applied) research credit. The IRS has initiated a campaign to scrutinize taxpayer claims of the qualified (applied) research credit to an even greater degree.
- **There are four types of qualified organizations** that may perform basic research for which a taxpayer that has funded the research may claim a tax credit:
 1. Educational Institutions
 2. Scientific Research Institutions
 3. Scientific Tax-Exempt Organizations
 4. Certain Grant Organizations

DAY FOUR THURSDAY – March 26, 2020

UIDP 2019 Summit Report – looking forward to Oxford 2021

Moderator: *Tony Boccanfuso, UIDP*

Presenter: *Phil Clare, University of Oxford • Tomas Coates Ulrichsen, University of Cambridge*

Last Summer 150 thought leaders from both sides of the Atlantic gathered to compare notes on many issues that exercise Universities, Industry, and Government. A wide range of topics were discussed from partnerships for data/AI to the inclusion of the Social Sciences in UI partnerships, from Equality and Diversity to metrics for Impact on Society. The speakers introduced the report with reference to 3 emerging issues: - Broadening our partnerships beyond the traditional - Developing effective partnerships for big data/AI - Demonstrating that universities and their partnerships with industry are delivering significant public value.

Takeaways:

- **Role of Social Sciences.** There is a growing recognition of the added value that social sciences can bring to these partnerships. Many emerging innovation opportunities require not just technological solutions, but also insight to how society and consumers will behave and respond to the new technology.

- **The Oxford UIDP Summit 2021.** The 2019 summit aimed to build a transatlantic bridge for thought leadership in University-Industry-Government relationships, and the report is our first foundation-stone. A second event will be held in July 2021 to build some more.

Recruiting, Training, and Retaining Contracting Talent

Moderator: *Kristina Thorsell, UIDP*

Presenters: *Elizabeth Adams, Princeton • Kathleen Rountree, University of Southern California*

Many companies and universities struggle to meet their research contracting personnel needs. This session was a roundtable discussion where attendees consider strategies and tactics for satisfying these personnel needs. The session reviewed UIDP's role in developing contracting talent among its member organizations and included a brainstorming session on further investments it may be able to make in this arena.

Takeaways:

- **On-boarding Programs.** A formal on-boarding program is super important to retaining new hires.
- **Growth Opportunities.** Give them opportunities to grow, expose them to new disciplines, industry sectors and emerging best practices.
- **Build a Pipeline.** Create a pipeline which makes it easier to fill positions more quickly and maintain hire-from-within practices.

The Changing Geography of Transdisciplinary Research

Moderator: *Sandy Mau, UIDP*

Presenters: *Chris Lambert, CannonDesign*

As the highest impact global projects become increasingly complex, research organizations continue to place value on working across disciplines. These transdisciplinary collaborations often include researchers working across departments within an organization, but increasingly institutions have also prioritized external and cross-industry partnerships to enable more comprehensive outcomes. Just as innovation clusters and research parks have started defining new geographies for the physical locations where research happens, an interior geography that responds to this transdisciplinary need has emerged.

Takeaways:

- **R&D Concentration.** The geography of major R&D investment--among commercial and academic organizations--continues to be concentrated in a few key metros in the United States.
- **Trans-disciplinary research**--both within and across organizations--has tended to increase in prevalence to solve large-scale, systemic problems.



Data Science for All: An Open-Source Approach

Moderator: Tony Boccanfuso, UIDP

Presenter: Andre de Waal, IBM

Demand for data science skills outpaces the ability of academic institutions to build data science programs. IBM, working with the University of Pennsylvania and the Linux Foundation, is bringing to market a “starter set” of data science training materials to be launched as an open-source project designed to help accelerate the availability of data science skills-building programs around the world and to enable other institutions to sustain the continued growth of the initial curriculum kit through their contributions. This session provided an overview of the project and showed how to access the educational modules hosted on GitHub.

Takeaways:

- **Access to Free Modules.** Educational modules that can be used to build a DS curriculum are available for free. Any educational institution can use these modules to develop a DS curriculum.
- **Module Platforms.** The modules, built for professors by professors, are based on Python and OSS tools.

Structuring Corporate Engagement Activities

Moderator: Cynthia Sweet, University of Pittsburgh

Presenter: Jeff Fortin, Penn State University • Sam O'Connor, Pfizer

Universities are evaluating how they structure corporate engagement functions to provide the greatest impact for their institutions and their industry partners. This session provided insights from several schools that have undertaken such a review and bring the industry perspective from working with these universities.

Takeaways:

- Both companies and universities manage partnerships in a variety of structures and engagement types.
- Communications and understanding between partners are key to help navigate successful collaborations.
- Industry and university engagement should benefit both parties.

How Technology Platforms Can Help Enable More University-Industry Partnerships

Moderator: Sandy Mau, UIDP

Presenter: Kevin Leland, Halo



Partnerships often form organically from existing relationships, geographic proximity, publication searches, or even serendipity. This approach can lead companies to miss out on innovative research from scientists located outside their region or internationally, as well as the cutting-edge work being done by early-career scientists. RFP campaigns may cast a wider net, but they can take months of planning and often achieve mixed results. This session covered new technology platforms that are helping companies and scientists to connect programmatically based on mutually shared research objectives, regardless of location, career stage or pedigree.

Takeaways:

- **Industry Wants.** These vary but include keeping a pulse on new innovations and technologies impacting their key interest areas. Expanding their network of scientists, universities, and startups beyond existing relationships. Deepen the visibility into relevant research happening within universities and early-stage companies, be accessible to scientists and startups looking to collaborate.
- **Halo.** It was designed from the bottom up to make it easier for scientists and companies to work together. Both university administrators and scientists can join. Pre-proposal takes less than an hour. Every proposal gets a response with feedback and scientists engage directly with industry partners.
- **Case Study – Baxter.** Halo's case study with Baxter assisted Baxter's partnering goals, business goals, and more. Halo did this by providing Baxter a platform for educational webinars so Baxter could efficiently answer questions directly from scientists. With two months of help from Halo, Baxter received 5x more proposals of interest in 25% of the time compared to traditional channels.



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UIDP thanks NSF for its financial support of this event:



The UIDPVirtual 2020 conference report is not intended to be a detailed record of the entire proceedings. Please contact UIDP at info@uidp.net if you have any questions or comments on this report.

About UIDP

At UIDP, we have different perspectives and one focus: strengthening university-industry (U-I) partnerships. Our membership comprises some of the finest innovation companies and best research universities in the world – organizations committed to active participation in pursuit of excellence at the U-I interface. At UIDP, we don't just talk about problems, we solve them.

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