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## Dartmouth Future of Work Listening Session Notes

### Dartmouth College Site (October 10, 2019 – Hanover, NH)

Session Name: **Welcome & Future of Work Introduction**

Session Date: **Thu., October 10, 2019**

Session Time: **9 - 9:45 am**

Scribe Name: Corporate & Foundation Relations team (Miguel Morales and Kate Norton)

Email: [Katherine.R.Norton@Dartmouth.edu](mailto:Katherine.R.Norton@Dartmouth.edu); [Miguel.A.Morales.Hernandez@dartmouth.edu](mailto:Miguel.A.Morales.Hernandez@dartmouth.edu)

#### **Please provide a 2-3 sentence abstract for your session**

Leaders from Dartmouth, local government and the state of New Hampshire and the NSF shared their vision for the Future of Work, and the impact of new technologies in higher ed and the workforce.

#### **Please list three key takeaways from the session.**

1. FoW is one of NSF's 10 big ideas. Presentation of the NSF's Convergence Accelerator by NSF Program Director Evan Heit. The program will accelerate use-inspired, convergence (grand challenges) research in areas of national importance via partnerships between academic and non-academic stakeholders. Areas of interest: enhancing public data use, AI and future jobs and building talent for the FoW.
2. FoW is important both regionally and nationally. Will Arvelo, Director of the Division of Economic Development for the state of New Hampshire spoke. He presented on the importance of this issue, both in terms of industry engagement and regional competitiveness (i.e. keeping up nationally) as well as training of students regarding future workforce skills.
3. There is an important role of universities in shaping the necessary skills for future workers. Responsibility includes both new methods of teaching and pedagogy as well as application of technologies in workforce augmentation. There is also a role for universities in terms of questions of ethics and societal issues more broadly.

***Following the session, please provide to (ADD)***



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## **Dartmouth Future of Work Listening Session Notes Dartmouth College Site (October 10, 2019 – Hanover, NH)**

**Session Name: Illuminating the Socio-Technical Landscape – Emergent Technologies & Pedagogical Approaches**

**Session Date: Thu., October 10, 2019**

**Session Time: 9:45 - 10:45 am**

**Scribe Name: Corporate & Foundation Relations team (Miguel Morales and Kate Norton)**

**Email:** [Katherine.R.Norton@Dartmouth.edu](mailto:Katherine.R.Norton@Dartmouth.edu); [Miguel.A.Morales.Hernandez@dartmouth.edu](mailto:Miguel.A.Morales.Hernandez@dartmouth.edu)

### **Please provide a 2-3 sentence abstract for your session**

Dartmouth's Professors Petra Bonfert-Taylor and Jeremy Manning discussed the educational innovations that are being implemented in the classroom to embed coding, data science and AI into the undergraduate curriculum. Ankur Jindal, from TATA Communications, shared their vision on interactions with machines as opposed to the replacement of workers, and the continuous learning and re-skilling process in order to achieve the latter. Similarly, Vin Tang from Samsung Next highlighted the quest for human enhancement, not replacement.

### **Please list three key takeaways from the session.**

1. New technologies, data science, coding and AI will become essential components of undergraduate curricula.
2. Industry partners recognize that certain non-desk workers (i.e. retail, hospitals, schools, etc.) are at the frontline of human interaction and require common sense, empathy, reasoning, and thus, difficult to automate or replace.
3. Employers need to do a better job at offering novel training tools and advance professional development programs to promote learning and re-skilling.
4. Memory and learning cognition studies can play a key role in helping to understand learning and help develop individualized learning plans for both students and adult ongoing learners. Jeremy Manning's work helping to advance new methods in this area.

***Following the session, please provide to (ADD)***



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## **Dartmouth Future of Work Listening Session Notes**

Session Name: **Building the Human-Technology Partnership – Robotics & AI**

Session Date: **Thu., October 10, 2019**

Session Time: **11 – 12:00 pm**

Scribe Name: Corporate & Foundation Relations team (Miguel Morales and Kate Norton)

Email: [Katherine.R.Norton@Dartmouth.edu](mailto:Katherine.R.Norton@Dartmouth.edu); [Miguel.A.Morales.Hernandez@dartmouth.edu](mailto:Miguel.A.Morales.Hernandez@dartmouth.edu)

### **Please provide a 2-3 sentence abstract for your session**

Robots and AI can achieve complex tasks and problems, but are not capable of performing full jobs, as discussed by Dartmouth's Professors Alberto Quattrini Li and Charles Sullivan. Intel's Mondira Pant shared their vision about the future of quantum and neuromorphic computing and the impact on future jobs. Hypertherm's Michael Shipulski introduced the Industry 4.0 (or the fourth industrial revolution and technological evolution) from embedded systems to cyber-physical production systems.

### **Please list three key takeaways from the session.**

1. Perception, mapping, control, planning and coordination are still a challenge for robots, and require substantial human interaction. Robots will not "take your job away," since they still require substantial human development and programming. These skills do merit a need for training on these types of skills, in the workplace and education.
2. As part of the Industry 4.0, employers will need to offer training and continuing professional development, increase safety and security and deploy participative work design and lifelong learning measures. All of these will require alignment with developing AI and robots skills for enhanced workplace performance.
3. The "smart office" of the future will rely on batteries and wireless power transfer. Wireless power will become essential for computers and robots, to become fully autonomous and untethered, medical implants and devices and vehicles whether autonomous or not.
4. Similarly, quantum and neuromorphic computing are quickly emerging technologies, and we need more skilled workers to help build and advance these technologies.

***Following the session, please provide to (ADD)***



## **Dartmouth Future of Work Listening Session Notes**

Session Name: **Lunch and Panel Discussion**

Session Date: **Thu., October 10, 2019**

Session Time: **12.20 – 1 pm**

Scribe Name: Corporate & Foundation Relations team (Miguel Morales and Kate Norton)

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### **Please provide a 2-3 sentence abstract for your session**

This session was moderated by the Dean of the Thayer School of Engineering Dean, Alexis Abramson, and features expert panelists from across large and small corporate businesses and government representatives at the state and federal levels. The discussion focused on identifying the most pressing needs within each sector and ways to address challenges related to new talent development, upskilling the existing workforce, and the unique challenges of facing states with an ageing workforce to remain competitive for economic growth and development.

### **Please list three key takeaways from the session.**

1. There is an increasing need to move beyond simple retraining to models that cultivate agile lifelong learners who are comfortable with continuous adaptation. These practices will rely on education interventions that begin and are sustained through K-20 education, collaborative research, innovation in HR and workforce education, and implementation of new best-practices.
2. Non-desk job workers and their positions (which include retail, bus drivers, nurses service-staff, etc.) are largely left out of the considerations for Future of Work and Digital Transformations in the workplace. More than 50% of most company employee base falls into this category.
3. Many states and industry employers face challenges related to an aging labor force (estimates as high 25% of the labor force in 2024 will be 55 or older) which also coincides with an increased participation of older workers. We need to think about training this workforce as well.

***Following the session, please provide to (ADD)***



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## **Dartmouth Future of Work Listening Session Notes**

Session Name: **Future of Work – Ethical perspectives**

Session Date: **Thu., October 10, 2019**

Session Time: **1.10 – 1.50 pm**

Scribe Name: Corporate & Foundation Relations team (Miguel Morales and Kate Norton)

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### **Please provide a 2-3 sentence abstract for your session**

Dr. Wernimont and Dr. Rose spoke about how technological developments can promote labor substituting or labor complementing. These technological advancements and productivity gains can be put toward different ends. These are shaped by, among other factors, institutions and policies.

### **Please list three key takeaways from the session.**

1. New technologies and advancements carry inherent risks and they need to be regulated.
2. Technological development can enrich the workplace by expanding production and free time, improving the organization and reducing the need for repetitive, degrading or grueling work.
3. Our institutions and policies should be arranged to shape the path of technological development toward the aim of ensuring that workers and job-seeking individuals have fully adequate resources and -equal- opportunities.

***Following the session, please provide to (ADD)***



## **Dartmouth Future of Work Listening Session Notes**

**Session Name: Illuminating the Socio-Technological landscape: Workforce, Hiring and Management**

**Session Date: Thu., October 10, 2019**

**Session Time: 2.10 – 3.10 pm**

**Scribe Name: Corporate & Foundation Relations team (Miguel Morales and Kate Norton)**

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### **Please provide a 2-3 sentence abstract for your session**

Filtered.ai explained how the Future of Work will undoubtedly affect the current hiring process and we will see AI increasing the accuracy of this process. Professors Andrew Campbell and Pino Audia discussed new parameters to measure the performance of the workers of the future. Citrix presented the use of new technologies to better engage employees with their daily tasks, increase workplace performance, enhance creativity, and lessen the daily mundane tasks that employees dread.

### **Please list three key takeaways from the session.**

1. Repetitive, structured work will inevitably end up in a lower productivity. These are tasks that can be easily replaced by machines leaving more creative work in the hands of human beings.
2. AI and wearable devices can effectively measure performance attributes and will help employers to improve the working conditions to achieve higher productivity.
3. The current hiring process has many issues, especially for tech talent (e.g. quantity over quality, rampant fraud, slow process).
4. AI can be used to lessen implicit bias by employers who may overlook the actual skills needed for success for their open positions. Such skills are often not included (or able to be accurately judged) by resumes.

***Following the session, please provide to (ADD)***



## **Dartmouth Future of Work Listening Session Notes**

Session Name: **Building the Human – Technology Partnership – New Approaches in Medicine**

Session Date: **Thu., October 10, 2019**

Session Time: **3.20 – 4.20 pm**

Scribe Name: Corporate & Foundation Relations team (Miguel Morales and Kate Norton)

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### **Please provide a 2-3 sentence abstract for your session**

Artificial Intelligence and new technologies are already having an immense impact on patient health and medical diagnostics. Professors Saeed Hassanpour, Caroline Robertson and Temi Prioleau shared insights on the use of AI, wearable devices and VR to find clinically meaningful patterns in health big data, in order to improve the speed and accuracy of diagnostics. Dr. Whittaker, from the US Navy, discussed the use of new technologies to derisk military operations and reduce the number of casualties.

### **Please list three key takeaways from the session.**

1. AI is a powerful tool for healthcare, yet reproducibility is still challenging. Wearable computing systems have a critical role to play in the future of medicine.
2. It will be necessary to establish trust between AI and clinicians and patients. Medical practitioners need to understand the advantages, but also the limitations of AI.
3. The Future of Work will be significantly influenced by the Future of Health, and maximum benefit will be achieved when AI, wearable devices and new technologies are seamless integrated in patients' lives.

***Following the session, please provide to (ADD)***