

DESHPANDE BITS & BYTES

Message from the Executive Director



We are approaching one year of being physically distanced, yet MIT's spirit for innovating remains undaunted. Our Deshpande teams continue their lab research, working on technologies that they hope to push out into the market to better the world. We'll feature these technologies at our upcoming IdeaStream 2021 conference in April. Though we won't be able to see each other in person, we will carry on the IdeaStream tradition of exchanging ideas, getting a preview of the teams' research, and making new connections while catching up with old friends. The projects range from medical to energy, optics to polymers, and machine control to crop protection. Read on and stay connected to hear their latest.

- Leon Sandler, Executive Director

IdeaStream 2021 Conference Will Showcase Deshpande-Backed Research in April



IdeaStream, the Deshpande Center's premier annual event, will be held virtually April 14-15. The conference will highlight the cutting-edge research of our Deshpande teams, and feature moderated panels that will discuss fund-raising for startups. Attendees can engage in Q&A with our researchers, and network with MIT faculty and tech innovators.

[View the Agenda and Speakers](#)

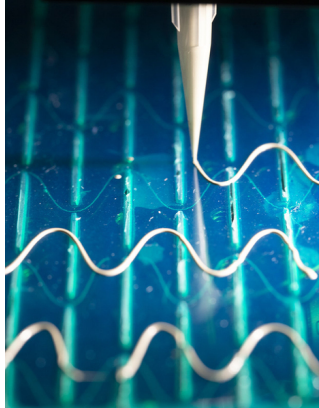
Spinout & Grantee News

Healing With Hydrogels: Developing a Bioadhesive Tape to Repair Damaged Tissue

After an accident landed his brother in intensive care with traumatic injuries, Deshpande grantee Hyunwoo Yuk worked to develop a bioadhesive tape that can repair

Inkbit Launches New Additive Manufacturing System that Revolutionizes 3D Printing





damaged tissue. In November, he earned the top prize at the Collegiate Inventors Competition for his invention, SanaHeal, a bioadhesive tape that can easily bind to tissues or organs. The tape

could one day be used in place of sutures to promote healing and minimize complications after surgery. Yuk works with Principal Investigator Xuanhe Zhao and Christoph Nabzdyk of the Mayo Clinic on the Deshpande project [High-Strength Tape for Surgical Sealing](#). | [Read the MIT News Article](#)

Deshpande spinout Inkbit has launched its first commercial 3D printer, the Vista. The highly automated 3D printing ecosystem features the first of its kind closed-loop feedback control, multi-material printing capabilities, and exceptionally low cost-per-part for final part production. Vista will enable manufacturers to bridge the gap between prototyping and full-scale production. Inkbit spun out of the 2013 Deshpande project [A Platform for Multi-Material Fabrication](#). | [Read the TCT Magazine Article](#)

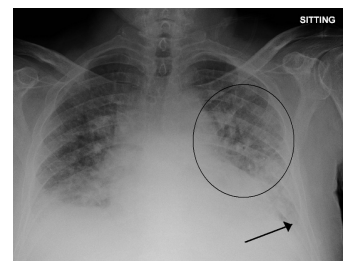


Coagulo Announces \$6.5M in Financing to Accelerate Delivery of Coagulation Diagnostics Platform

Deshpande spinout Coagulo Medical Technologies, which developed the world's first precision-medicine platform for comprehensive and targeted blood clotting management, announced in December it has raised \$6.5 million in financing from 20/20 HealthCare Partners, Sands Capital, Good Growth Capital, IAG Capital Partners and private investors. The startup also announced it has been awarded a Small Business Innovation Research (SBIR) grant by the National Science Foundation to accelerate delivery of breakthrough innovations amid the global Covid-19 public health crisis, which has called attention to the limitations of conventional coagulation tests. Coagulo spun out of the Deshpande project [Bedside Testing of Coagulation](#). | [Read on Business Wire](#)

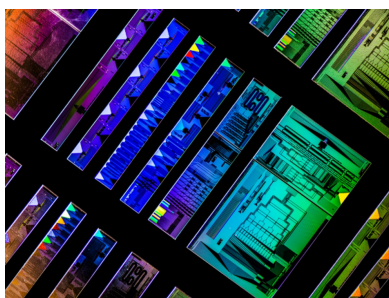
Anticipating Heart Failure With Machine Learning Through Edema Diagnosis

One of acute heart failure's most common warning signs is pulmonary edema. A patient's level of excess fluid often dictates



the doctor's course of action, but such determinations are difficult and require clinicians to rely on subtleties in X-rays that sometimes lead to inconsistent diagnoses and treatment plans. To better handle that kind of nuance, a group led by researchers at MIT's Computer Science and Artificial Intelligence Lab (CSAIL) has developed a machine learning model that can look at an X-ray to quantify how severe the edema is. The team plans to test the model in Beth Israel Deaconess Medical Center's emergency room workflow this fall. This research is part of the current Deshpande project [Noninvasive Assessment of Pulmonary Edema Using Machine Learning](#). | [Read the MIT News article](#)

Building a New Solid-State LiDAR-on-a-Chip System



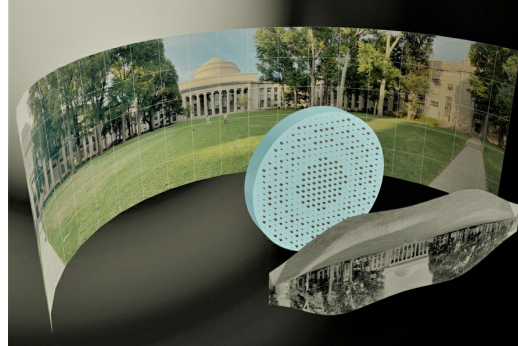
To enable safe and affordable autonomous vehicles, the automotive industry needs light detection and ranging (LiDAR) systems that are around the size of a wallet, cost \$100, and can see targets at long distances with high resolution. A team of researchers is advancing the next generation of LiDAR sensors by developing a solid-state, LiDAR-on-a-chip architecture. The technology has an extremely wide field of view, a simplified control approach compared to state-of-the-art designs, and the promise to scale to millions of units via the wafer-scale fabrication

methods of the integrated photonics industry. This type of information is critical because it allows an autonomous vehicle to detect and safely navigate around other vehicles, cyclists, pedestrians, and any potentially dangerous obstacles on the road. This research is part of the current Deshpande project [Wide-Field-of-View Chip-Scale LiDAR for Autonomous Machines](#). | [Read on IEEE Spectrum](#)

Engineers Produce Completely Flat Fisheye Lens

To capture panoramic views in a single shot, photographers typically use fisheye lenses — ultra-wide-angle lenses made from multiple pieces of curved glass, which distort incoming light to produce wide, bubble-like images. Their spherical, multipiece design makes fisheye lenses

inherently bulky. Engineers at MIT and the University of Massachusetts at Lowell have designed a wide-angle lens that is completely flat. It is the first flat fisheye lens to produce crisp, 180-degree panoramic images. The new design could potentially be adapted for a range of applications, with thin, ultra-wide-angle lenses built directly into smartphones and laptops, rather than physically attached as bulky add-ons. This research is part of the current Deshpande project [Ultrawide Field-of-View Metasurface Flat-optics platform](#). | [Read the MIT News article](#)



Deshpande Events

Giving Legal Pointers for Launching a Startup

David Gammell of Gunderson Dettmer presented in January the Deshpande Center's 2021 MIT Independent Activities Period course, Legal Dos & Don'ts: What to Know When Starting Your Startup, along with "Catalyst" mentor Paul Blackborow.



Presenting Latest Developments in Chemical and Molecular-Based Sensors

Timothy Swager, Deshpande Center Faculty Director, delivered a presentation on the latest developments in chemical and molecular-based sensors in the Center's Innovation Meeting Series. The small, invitation-only seminar in January was a dialogue with members of various corporations.



A Deep Dive Into Customer Discovery



Deshpande Innovation Manager Karen Golmer held a Customer Discovery Workshop in November. A big thanks to our Catalysts, George Mabry, Thomas Pounds, and Steve Kelly, who shared their expertise and insights with our Deshpande project teams.

Make Innovation Possible: Giving Opportunities



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