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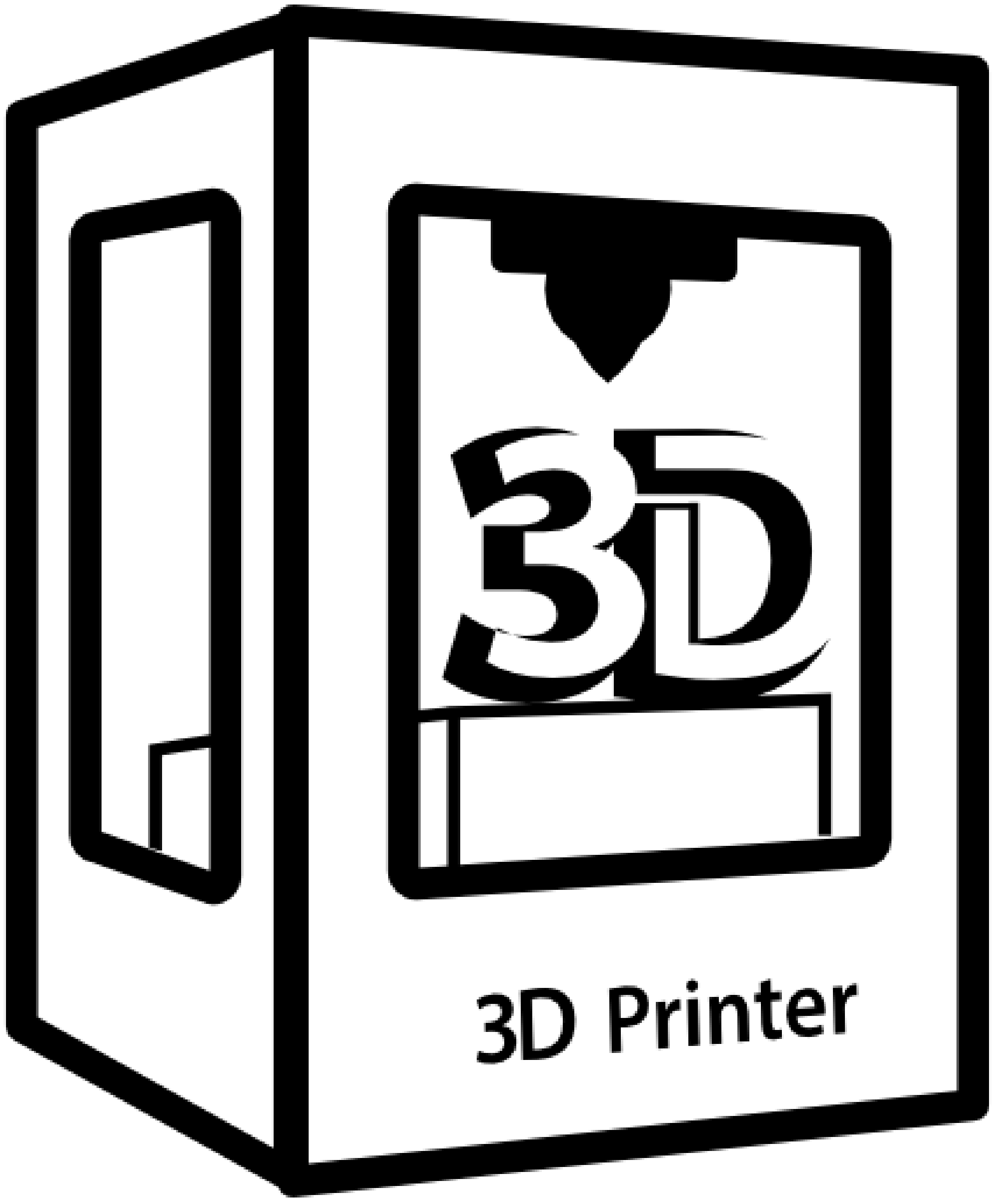
The new 3D printer



In 1988, Scott Crump invented Fused Deposition Modeling (FDM), a 3D printing technology that uses thermoplastic material, which is heated and deposited layer by layer. As each layer cools, it solidifies, eventually forming the desired shape. Not only did this method become a cornerstone of 3D printing, but it also remains one of the most widely used technologies today.

The origins of 3D printing trace back to Japan in the early 1980s. In 1981, Hideo Kodama, a researcher at the Nagoya Municipal Industrial Research Institute, developed one of the first rapid prototyping systems. He created a machine that built objects layer by layer using a photosensitive resin solidified by ultraviolet (UV) light. Despite the significance of his work, Kodama did not complete the patent process, although his contributions laid the foundation for future innovations.

At the same time, Charles Hull, an American engineer, was advancing similar concepts. In 1984, Hull developed Stereolithography (SLA), a method that also used UV light to cure liquid layers of photosensitive resin into solid objects. Not only did Hull improve on earlier concepts, but he also filed the first official patent for SLA technology in 1986. In 1988, Hull founded 3D Systems Corporation, which released the first commercial SLA 3D printer, the SLA-1, that same year.

Meanwhile, in 1988, Carl Deckard, a student at the University of Texas at Austin, patented Selective Laser Sintering (SLS). Instead of liquids, SLS used powdered materials—such as plastic, metal, or ceramics—fused together by a laser to form solid parts. This advancement enabled the creation of complex geometries and highly durable objects without needing support structures, making it particularly valuable for industrial applications.

Technological advancements in bioprinting have revolutionized the potential of 3D printing, pushing the boundaries of medical science. In the early 2000s, scientists began exploring the possibility of printing human tissues and organs using bioinks—materials composed of living cells. Not only has 3D bioprinting enabled researchers to create skin, cartilage, and even small organ structures, but it has also opened the door to printing fully functional organs in the future.

In 2013, researchers at Princeton University successfully printed a functional ear by integrating electronics with biological materials, demonstrating the potential of combining electronics with tissue printing. By 2019, Israeli scientists printed a small 3D heart using human cells, marking a significant step toward creating functional, transplantable organs.

Bioprinting continues to evolve, with a focus on creating more complex tissues and achieving the ultimate goal of printing functional, transplantable organs such as kidneys and livers. These advancements are paving the way for breakthroughs in regenerative medicine and patient-specific treatments, where organs can be printed to match an individual's biological characteristics, potentially reducing the risk of organ rejection.