

Intelligent Materials

By: Jack Harrison

To understand intelligent materials one must understand the notion of moving from atoms to bits. Today we have the ability to manipulate atoms with bits, such as using our phones to start our cars or control the heating or lighting in our homes. This is the first time bits have been at our fingertips that control the atoms around us, which is why phones may be looked at in the future as milestone in controlling our lives with bits. Depicted in various movings such as Iron Man and Minority Report, the future is full of non touch or non physical computing. In Iron Man Tony Stark controls holograms with nothing but his fingers, he is not feeling these holograms but since his has a visual reference he can control them with ease. This is the start of complete manipulation of the bits in our lives. This is what will lead to what is called Intelligent Materials. What if technology could access materials at an atomic level? MAterials would then begin to behave more like the dynamic screens we use today. For example one could change the very texture and color of their homes wallpaper, much like we change the wallpaper on our phones today. The fields that are making this a reality today are called adaptive materials and programmable matter. Today materials have static properties, like appearance, strength, elasticity, translucency or any combination of those. Designers must pick these materials based on these characteristics but with the dawn of intelligent materials, a designers work with materials could be similar to their work with electronics, coding the very materials themselves to change their properties at will. Bits controlling atoms. None of these advancements could be possible without interdisciplinary collaborations between biology, computer science and materiality. Some strides in intelligent materials comes from scientists using microtextures found on various plants and animals. Microtextures found on sharks are being used to prevent bacterial growth on naval ships, decreasing their cleaning time and their travel time. They are also being used in hospitals, preventing germs from even attaching on surfaces, eliminating the use for harsh cleaning chemicals that can result in superbugs. There are also some non stick microtextures being used from plants to create similarly easy to clean surfaces for use in public areas or even on your clothes. Finally, another microtexture is being used to create a suit that allows a human to climb up smooths urfaces, this texture comes from geckos feet. There are many advancements in intelligent materials but to achieve the truly there needs to be development in additive manufacturing and dynamic structures.