香港城市大學
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# Skunkworks – New Reactive Materials for Art and Design

**Project Number:** 6000549

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**Grant Type:** TDG

**Abstract:**

3D printing today has become a norm in modern day design and production. It has become ubiquitous, affordable, and easy to use. Its widespread application ranges from large scale production industries to household applications, and has become part of most primary, secondary and tertiary education. Yet, while being a precise method to produce complex form and shape, the material palette in 3D printing is rather limited, which in turn effectively undermines a more creative, narrative and performative aspect to emerge from within this design and manufacturing process. On its own, it is hard to see how 3D printing will be able to foster a continuous sustainable change in art and design. In particular, with the advent of the Internet of things and the network ability of previous static design elements, the palette of the currently available materials is insufficient to translate digital embedded intelligence into the design and art of today. Design and materials today need to be more intelligent and reactive to be embedded into our digitally augmented culture.

Smart materials are designed to react to changes in the environment. Even subtle shifts in light, temperature, noise, moisture, electricity, pollutants, and more can cause dramatic changes in color, form or structure. For example, in some materials, electrical currents allow material reorganisation or the exposure to UV light causes colour change. The molecular structure of such materials reactively changes due to inputs and energy transfers.

Togetehr, the combination of 3D Printing technology and smart materials pose a significant step forward in the articulation of a contemporary and new design methodology. The anticipated results from the students working in this combined field potentially yield application in all design related industries and are hardly to overstimate in the framework of the Discovery Enriched Curriculum to create IP and Knowledge Transfer.

The proposal will provide an opportunity for students to explore how safe reactive technologies and materials could be used in combination with precise 3D printed substrates. The emerging prototypes will be able to display environmental changes and be able to embed choreographed behavior, information and chemically interactive design into objects and artworks

The grant will allow students access to 3D printing ranging from domestic to industrial standard. It also will provide small amounts of commercially available, non-toxic, safe materials. It will facilitate the creation of a new type of workshop and learning environment where students can hands-on build

projects using 3D printing, 2D Laser cutting, graphic printing, kinetic sculpture, textile design and more. As the title skunkworks indicates, the proposal also offers pedagogical exploration in how to manage larger studio courses in an experimental setting where students learn the steps required to research, plan, prototype, test, fabricate, exhibit and document their projects. The aim here is to provide a real life skunkworks experiment, where students competitive learn to discover new relations between experimentation, manufacturing, display and the documentation of art and design.