



## Science and Technology

### BORDER SECURITY

# SYSTEMS AND METHODS FOR INTERRUPTING TRADITIONAL COUNTERFEITING WORKFLOWS

THE TECHNOLOGY OFFERS SYSTEMS AND METHODS FOR DESIGN OF SECURITY DOCUMENT ARTWORK THAT IS RESISTANT TO COUNTERFEITING AND COUNTERFEITER REVERSE ENGINEERING.

The use of counterfeit identification documents, including birth certificates and passports, is rising within the US. The processes for generating counterfeit documents are advancing, almost matching the legitimate document printing processes. Enhanced anti-counterfeit technology is needed to deter counterfeiting methods. Researchers at the US Immigration and Customs Enforcement, with the Department of State, developed the Systems and Methods for Interrupting Traditional Counterfeiting Workflows (SMIT).

SMIT presents methods to obscure how artwork in genuine security documents is designed and printed, making such artwork harder to counterfeit. SMIT includes a novel press and plate setup in which the artwork on each plate corresponds only to a portion of the composite image. The system also minimizes artwork cues in printed composite images, limiting reverse engineering and enabling easier counterfeit identification. A related DHS patent family [[see Advanced Anti-Counterfeit Security Elements](#)] includes printing advanced design elements on sensitive documents to prevent counterfeit replicates.

### KEY BENEFITS

- + Increases identification document security
- + Enables better counterfeit recognition
- + Hinders document reverse engineering

### STAGE OF DEVELOPMENT

Proof of Concept

### PARTNERSHIP SOUGHT

License

### INVENTORS

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### DHS COMPONENT

US Immigration and Customs Enforcement

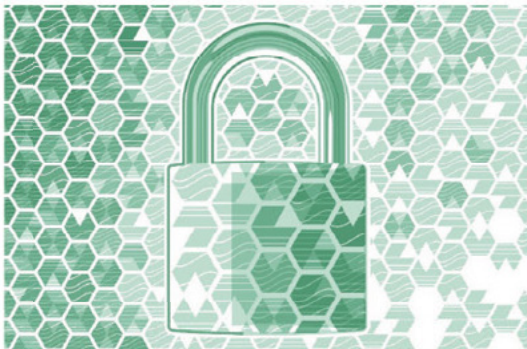
The Technology Transfer and Commercialization Branch (T2C) within the Office of Industry Partnerships (OIP) of the Department of Homeland Security (DHS) Science and Technology Directorate (S&T) serves as the centralized point to manage technology transfer activities throughout DHS and the DHS laboratory network. **T2C@hq.dhs.gov**

## THE TECHNOLOGY

SMIT involves several methods and strategies to fortify security document artwork by preventing counterfeiters from identifying the number of printing plates, the specific artwork design included on each printing plate, and other aspects of the press setup. One method involves overlapping monochromatic artwork, where offset layers of the artwork are printed in a single ink color at varying ink fill levels to create complex patterns. By printing the image in a series of layers, nefarious entities cannot determine how many separate plate images were used and the graphics associated with each plate. The system makes document artwork harder to replicate and reverse engineering challenging. The monochromatic printing strategy also involves more complex artwork and graphic elements printed in more layers to further obfuscate a design.



*Four individual printing plate images, each using the same graphic style to prevent any of them from standing out, which are then added together to form the composite image shown below.*



*Composite artwork using the four individual plates shown above. Areas of higher density are created not just by covering more surface area, but also by overlapping multiple layers of green ink.*

## APPLICATIONS

The technology has several potential end users:

- + Security printers and secure document issuers
- + Border control authorities and forensic laboratory staff
- + Printing suppliers and paper manufacturers
- + Vehicle title, birth record, and real estate deed issuers

## PATENT INFORMATION

US Patent number 10,946,683



See related patent family  
“Advanced Anti-Counterfeit  
Security Elements”



## CONTACT INFORMATION

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**FOR MORE INFORMATION ABOUT THE DHS TECHNOLOGY TRANSFER  
& COMMERCIALIZATION BRANCH:**

<https://www.dhs.gov/science-and-technology/technology-transfer-program>



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