

For immediate release

## Fuji Xerox Develops Yoctrace, a Technology That Recognizes the Surface Patterns of Objects Through Advanced Image Processing

### For Use in the Authenticity Assessment of Gift Certificates, ID Cards and the Enhancement of Security for Virtual Currencies

TOKYO, July 27, 2017 – Fuji Xerox Co., Ltd. has developed Yoctrace<sup>Note 1</sup>, an object recognition technology that recognizes inherent random patterns inadvertently generated on the surface of objects such as industrial products, and has commenced providing its license targeting the printing industry, among others.

By leveraging Fuji Xerox's advanced image processing technology, Yoctrace has applied individual paper recognition technology, first developed by the Company in 2002—the world's first<sup>Note 2</sup> at the time—, to industrial materials other than paper, enabling authenticity assessment and unique identification<sup>Note 3</sup> using an original algorithm. The technology can be applied not only to the prevention of counterfeiting but also to the enhancement of security for saving virtual currencies on printed paper by combining with blockchain<sup>Note 4</sup> technology.

Specifically, a smartphone, digital camera or a scanner is used to take the image of the surface patterns of a target product, and the image is registered in the server. Then, the image of the same part of the object that needs to be verified is captured, and the two images are compared. The accuracy of verification using this technology is extremely high since the whole image containing random patterns is used for verification. This contrasts with conventional fingerprint authentication, where only extracted characteristics of the fingerprints are used for verification. Thus, Yoctrace is fit to prevent the counterfeiting of gift certificates and identification (ID) cards, for which a high level of security is required.

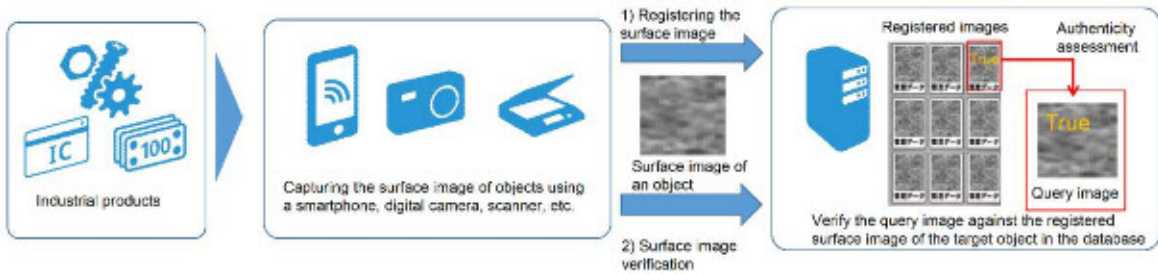
Since the target of verification is an image of the object itself, there is no need for tagging individual objects using serial numbers or barcodes, which allows for the identification of small objects for which tagging is difficult such as pills. Moreover, Fuji Xerox is equipped with optical systems knowhow<sup>Note 5</sup> to ensure that the verification of surface images will not be affected by color shading or unevenness of object surfaces when taking pictures.

While Fuji Xerox has been advancing technologies related to document copying, and offering copies with more precise and high-quality images that are closer to the original, the Company also recognized the need to develop this technology to guarantee originality. To enable this technology to be applied to various industries, Fuji Xerox will further pursue ways of identifying the uniqueness of an object—not only to prevent counterfeiting but also as an IoT (internet of things) technology—

linking individual history of various objects with their manufacturing history for the purpose of quality management during the manufacturing process, or for optimizing logistics.


According to the Organisation for Economic Co-operation and Development (OECD), the value of economic loss due to counterfeit and pirated products has reached nearly 500 billion US dollars<sup>Note6</sup>, which is equivalent to approximately 2.5 percent of the global trading amount. The targets of counterfeit and pirated products range from luxury brand products to medical products, electronic components, aircraft and automobile components, agricultural chemicals and food products. It is a serious problem that such counterfeit products have become increasingly malicious and sophisticated in line with the development of technologies used for counterfeiting.

Technology Overview



- Note 1: A coined term that combines “Yocto,” indicating the smallest System International (SI) unit, and “Trace,” meaning tracing. It indicates that the accuracy of the unique identification of this technology is extremely high.
- Note 2: According to Fuji Xerox research
- Note 3: Identifying a piece of information from mass data
- Note 4: Distributed database that is used to maintain a continuously growing list of ordered records called blocks
- Note 5: Technology to optimize the resolution and size of image reading, lighting method, etc. in accordance with target objects
- Note 6: Announced in April 2016

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