* Problem statement:  What is the topic about.  What it means?
* Why is it useful?  What is its applications?
* List of papers or open source links that you found about the topic and plan to look at it

Project Number: 10

Project Area: Computer Vision, Imaging and Optical Science

Faculty: Osama Alshaykh

Project: Detecting 3D objects

LiDar and Arkit are great tools for 3D scanning

What is LiDar? LiDAR stands forLight Detection And Ranging, but it may also be commonly referred to as “3D laser scanning” or some variation thereon. The technology works by bouncing light waves at surfaces and measuring the reaction time to determine the shape and distance of objects in the area. It is very efficient to obtain 3D models of various objects by using LiDar.

ItWhat is ARKit? ARkit stands for Augmented Reality Kit, a development platform that enables app developers to build AR experiences quickly and easily into their apps and games. It utilizes your iOS device's camera, processors, and motion sensors to create some immersive interactions. It was introduced by Apple and it provides room for creativity for developers. For example, one could preview Ikea products in his or her own home before making a purchase and look at the product from all the angles needed. This process makes it easier for Ikea customers to detect defects in the product before purchasing. With the aid of AR, it is even possible to measure the Ikea furniture dimensions and test the product virtually whether a couch fits in the living room or a bed fits in the bedroom. The biggest advantage of having a such mobile app would be to make sure that Ikea gets more positive feedback from its customers. It would eliminate the hassle of purchasing an item, that doesn’t meet one’s expectations. Thus, it results in more positive and less negative feedback from customers.

Using the ARkit and LiDar tools, it is possible to create a mobile application that scans the meticulous details of jewelry items. Since jewelry items such as rings are very expensive and it’s very hard to tell an original gold or silver ring from a fake one just by looking at the pictures online, we propose a new app that determines the properties of the ring by scanning it from different angles. We could do the same procedure to Adidas or Nike sneakers to determine whether they are from original brand or fake one, whether they are made of leather or rubber and plastic. It would make it easier for both parties, customers, and the retail stores/jewelry shops to make a safe transaction. It is a win-win situation for both parties: customers are happy with their purchases, while the other party builds a strong reputation for providing high-quality items for sale.

Open Sources and Research Paper References:

1. <https://developer.apple.com/augmented-reality/>
2. https://www.pocket-lint.com/ar-vr/news/apple/141615-apple-ar-kit-explained33t
3. <https://developer.apple.com/documentation/arkit/content_anchors/scanning_and_detecting_3d_objects>
4. https://www.researchgate.net/profile/Marek-Woda/publication/333039077\_Capabilities\_of\_ARCore\_and\_ARKit\_Platforms\_for\_ARVR\_Applications/links/5d24e096299bf1547ca75dfe/Capabilities-of-ARCore-and-ARKit-Platforms-for-AR-VR-Applications.pdf?origin=publication\_detail