Project Proposal – **Foot Scanner Mobile App**

1. Introduction

FootBalance is a Finnish growth company with a footprint in 50 countries. The company vision is to become the new standard in consumer-focused foot health & wellbeing technology, services, and products. For 15 year, FootBalance has been providing foot analysis services with a patented podoscope device available at selected sports stores and physiotherapy clinics. We provide information of the consumers' unique feet, enabling production of personalized insoles, and help recommend shoes and supportive products. In the near future, FootBalance will launch a new technology platform to provide the same benefits and more. The new technology is standalone physical device which creates a dynamic scan image of the consumers lower limb (from knee down). The image will be stored into the cloud and used for personalized analyses and services. This procedure will still require a visit to a store or clinic where the scanning device is located.

The purpose of this project is to replicate the lower limb scan achieved by the standalone machine by using a mobile phone technology, more specifically the upcoming iPhone 12 Pro model which has a LIDAR depth camera needed for this application. The app would be used independently by a consumer, and the resulting scan will be used to derive the benefits described above. The mobile app will make it possible for the consumers to get the scan without visit to a specific physical location.

2. Project goals

The project goal is to create an app for mobile devices that would imitate the above process, including 3D point cloud / model of the user's feet in the same format as the physical FootScanner. The point clouds are uploaded to our cloud service.

The currently the best app available for the purpose is Wiivv App (Android & iOS) – we aim for a far better UX and scan results enabled by the new depth camera technology.

3. Technologies and work-to-be-done

Apple ARKit 4 (beta) environment

- Developer license(s)
- HW (iPad Pros / iPhone 12 Pros)
- SW (IOS14 + Xcode, etc)

Using ARKit 4 (Beta), develop the following for all postures:

- Acquiring the 3D lidar scan of a foot
- Ensuring the quality of the scan (e.g. manage/optimize/filter point clouds)
- Cut/remove unnecessary areas
- Create a common 3D model point cloud model (e.g. pcl/ply)
- Rotate/normalize model to the coordinate system (XYZ)
- Add all measurement points to the data
- Surface rendering including lights
- Real time rendering/rotation of the model (30-60fps)

- Save model to cloud
- Build the application in sprints (App/PWA?)

Students will manage the required technologies with our partners' support, however familiarity of the dev tools/ecosystem is preferred.

4. Requirements for the students

- Understanding of modern development techniques (Agile)
- Familiarity/interest of Xcode environment
- Interest in 3D modelling
- ARKit understanding/interest
- Apple App interest/ PWA (implementation is not yet decided)

5. Legal Issues

Intellectual Property Rights (IPR):

1. ~~The results are published under open source license X (name the license, if already known)~~
2. The client gets all IPRs to the results.

Confidentiality:

1. The client will share some confidential information with the students.
2. ~~The client will not share any confidential information with the students.~~

6. Client

- The extended FootBalance team (incl. partner companies) has 3D modeling & hardware expertise, biomechanical understanding, and extensive modern software development competence. We have experience in Apple ecosystem development, and experts with various skills and competences available to support the project.
- FootBalance will provide necessary hardware tools (incl. the iPhones / Mac computers as necessary) & virtual meeting tools.
- The project work is expected to be carried out primarily online; Delivery of the iPhones and any necessary physical workshops will be organized at FootBalance premises, following strictly the governmental guidelines on Covid-19 precautions.

Client representative(s)

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