***Total time: around 2:30min.***

***[Introduction] – n minutes***

We present Vidgets (we need to finalize a name), a technique that allows the user to carry out touch input on passive objects by swiping across their surfaces. There is no need to instrument the objects with electronics and sensors.

[pause to quickly show demos of our technique, e.g. natural bumps, 3D printed bumps, etc].

***[Motivation] – n minutes***

Enabling touch input in physical environment allows easy and quick access to computing power. While most of the everyday objects in a user’s surrounding provide a surface for touch input

[pause to show finger swipes on a wall, table, cup, pen, etc],

Instrumenting the environment for always-available input is technically challenging for most users

[pause to show a user having hard time getting the electronics work properly].

Additionally, special-purpose body worn sensors are not accessible by today’s users.

[pause to show pictures of the existing devices]

***[Our solution]*** ***– n minutes***

Vidgets utilizes the bumps that exist on the surfaces or in the structures of many ordinary objects. The system recognizes when the finger swipes across such bumpy surfaces, only using an inertia measurement unit such as those build into existing finger or wrist worn smart devices.

[pause to show the raw sensing data when the finger swipes on a natural bump]

***[Show how it works]*** ***– n minutes?***

When the user’s finger swipes across the bumpy surface of an object, a mechanical vibration is generated that can be sensed by the IMU sensor and uniquely labelled for object identification.

[pause to show uniquely identify different natural bumps – show the system can identify table, keyboard, etc]

A user can also 3D print her own bumpy surfaces to enhance the recognition capability and flexibility of Vidgets

[show finger swipe across a number of different synthetic bumps and show the system can differentiate them, e.g. bump1, bump2, etc]

After the bumpy surfaces are printed, the user can attach them to any suitable objects and assign the desired functionality to enable touch input.

[pause to show a user can easily instrument the environmental object using the synthetic bumps.]

[monitor shows ‘table’ when the user swipes on the printed bump attached to the table and ‘draw’ when the user swipes on the natural bump of the draw handle]

***[Use scenarios]*** ***– n minutes?***

[1] Vidgets can be deployed in children’s museum where children can swipe on surfaces of the exhibitions.

[pause to show ]

Swiping on the different parts of the shell plays different videos for detailed explanation.

[pause to show]

[2] At home, a user can swipe the edge of a cutting board to open the favorite recipe book on a tablet.

[pause to show]

In the kitchen, while cooking, a user can swipe the edge of the cutting board to flip pages in the digital recipe book on a tablet (show cooking with dirty hands... show flipping forward, then swiping in the other direction flipping back again)

Afterwards, while cleaning up, the user can comfortably zap through the channels on the TV set

(show doing the dishes with wet hands, swiping on the plate holder to quickly zap through channels. Or perhaps, stick to the tablet, now cleaning up doing the dishes the user watches a movie on the tablet. Need to pause the movie, swipes the drying rack to pause, then comes back into picture and swipes again to start the movie...

The user can also switch channels of TV by swiping on plate holder.

[pause to show]

Swiping the synthetic stripes on the food bags quickly adds the calories consumption to the user’s mobile app.

[pause to show]

[3] Synthetic widgets can also be used for stylus interactions. A dentist uses a surgery tool with three stripes attached. When operating, the dentist can swipe on the stripes to control the view of monitor that displays X-ray images of the patient’s teeth.

[4] Touch input on the user’s body can be made possible through clip-on widgets.

[show synthetic widgets in pockets, on bags to either mute phone calls, turn on music volume or switch on and off lights]

Another nice scenario would be to show a person in a bedroom, about to go to bed. Then zoom in on his/her smartwatch scrolling through the menu to get to the alarm clock functionality to turn it according to a previously set “standard wake up time”. This ought to take many screen clicks... Then show a new version of the scene where the user only lays down in the bet, raises the arm and swipes across a decorative bump on the bed to activate the alarm. Then in the morning when the alarm goes on, the user swipes on the same bump to stop the alarm, or on another bump to start snoozing.

This would probably require quite a bit of acting and preparation of the stage (including a bed with a bump...), might be a bit difficult to arrange, but I think it would be a nice and strong application!