

# JUST A CLICK: A Solution to Transfer Images without Medium

Dr. Shubha Jain<sup>1</sup>; Ms. Shail Dubey<sup>2</sup>; Dr. Shalini Gupta<sup>3</sup>

1. Professor, Department of CSE, Axis Institute of Technology and Management, Kanpur, Uttar Pradesh
2. Assistant Professor, Department of CSE, Axis Institute of Technology and Management, Kanpur, Uttar Pradesh
3. Associate Professor, Department of CSE, Axis Institute of Technology and Management, Kanpur, Uttar Pradesh

## Abstract

In day-to-day work, images need to be transferred from the mobile phones to the laptop or to the systems. The only way to be transferred is with the help of a physical medium such as the data cable without which the transmission would not be possible, but carrying these physical devices all the times is not reasonable and sometimes not possible also. Even in the presence of physical devices, it is still a tedious task as required to go through the entire process of first connecting the data cable with both the mobile phone and the laptop and then selecting the necessary settings and commencing the required transfer. This process is not very time efficient. But an issue as small as this must not become a bottleneck and create delay in the fluency of work. Therefore, here a small yet effective application is proposed to tackle this issue on a small scale.

With the proposed application direct transmission of images may take place between the mobile phone and the laptop without the use of a physical medium such as a data cable. Based on augmented reality, this application is built with React Native features which make transmission possible through virtual scanning in just a click. The scanning takes place through OpenCv and the transmission through installing a local server between both the devices, mobile phones and the laptop or the system.

**Keywords:** Scan; React Native; OpenCv ; Basenet; Pillow.

## 1. Introduction

The frantic workload is not a recent phenomenon but it is getting worse day by day. The goal is lucrative productivity which is requisite both in life and work. Yet trying to ameliorate the time scheduling and prioritisation seems unlikely to work no matter how effectively designed. Time is a nonpareil asset. Whether one is a newbie or someone with the experience of a veteran, they are always going to need another hour to tick tasks off their to-do list. With the fast-paced workload environments time is the priority. Although one might want to perform multiple tasks together, it might be impossible to do every minute task at the same time. While managing time, one can boost their serenity and eventually in turn enhance their ability to focus. When people are not overwhelmed with work load, they can see that they are entwined with learning opportunities everywhere around them.

A number of researchers have defined Augmented Reality. It is a live and interactive environment which is formed by adding virtual objects to real images obtained by the camera [11].

In order to reduce the time, and effort of having to go through the entire process of connecting mobile phones and laptops/desktops with a data cable and then transferring the images from the mobile phone to the laptop, an application has been developed here which is based on augmented reality.

This helps in direct transmission of the data from the mobile phone to the desktop/laptop through virtual scanning in "Just A click". Comparing the previous methods where it generally requires approximately 5 to 10 minutes connecting the device with the system and specifically requires a USB cable and other expensive accessories, here this can be achieved within seconds without the use of a physical device or a medium. There are innumerable reasons why this little amount of time can do wonders for surviving in the over productive aura without the use of physical device or medium.



## 2. Related Works

In order to stand out from the crowd, accessing explicable time management skills over working with conventional ways is more than prominent [2]. This is the foundation of the research work. The application is made based on the React Native framework with the help of Typescript language. TypeScript is a strongly typed language for application scale JavaScript [3]. As the JavaScript code grows, it tends to get messier which makes maintaining and reusing the

code a complex job. Typescript was designed by Anders Hejlsberg at Microsoft for issuing this problem. Typescript is an object oriented and compiled language that is a typed superset of JavaScript compiled to JavaScript [7]. Typescript compiles the code and generates the compilation errors. It helps to highlight the errors before the script is run. TypeScript comes with a non-compulsory static typing and type inference system through the TLS (TypeScript Language Service). TypeScript also supports type definitions for existing JavaScript libraries. As shown in figure 1, React Native framework used allows building mobile applications on a native platform using JavaScript for enabling better user experiences.

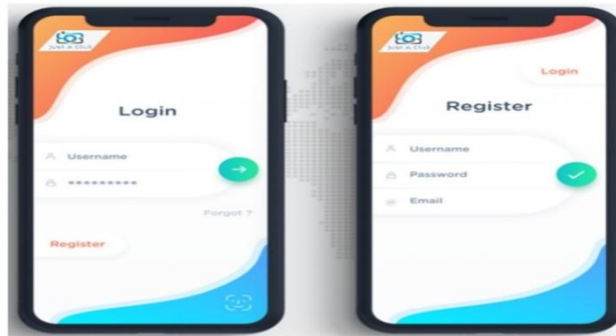


Figure 1: Building mobile applications on a native platform

With the use of React Native it was possible to render native applications for both iOS and Android mobiles [4]. The charge of the view controller is taken by React and using JavaScript, it programmatically generates native views. It targets mobile platforms, instead of targeting browsers. React's declarative UI framework to iOS and Android is brought by React Native. Figure 1.1 shows how with React Native; one can use native UI controls and have access to the native platform. React makes it painless to create interactive UIs. Declarative views have made the code more predictable and is easier to debug. With the help of React, encapsulated components have been built that manage their state. Local changes made to the JavaScript can be live reloaded without rebuilding the native application. Thus, the physical medium has been replaced which is required to make the image transfer between the mobile and laptop possible with the installation of a local server with the help of Basenet.

```

22 </div>
23 </div>
24 <div>
25   username: <div>
26     <input type="text" name="text" id="username" />
27   </div>
28   password: <div>
29     <input type="password" name="text" id="password" />
30   </div>
31   <button onclick="login()">Submit</button>
32 </div>
33 </div>
34 </div>
35 </div>
36 </div>
37 <script type="text/javascript">
38
39   function login()
40   {
41     var uname=document.getElementById("username").value;
42     var pass=document.getElementById("password").value;
43     if (uname=="world" && pass=="123")
44     {
45       location.assign("file:///C:/Users/Ashish/Desktop/page.html");
46     }
47   }
48 </script>
49 </div>
50 </div>
51 </div>
52 </div>
53 </div>
54 </div>
55 </div>
56 </div>
57 </div>
58 </div>
59 </div>
60 </div>
61 </div>
62 </div>
63 </div>
64 </div>
65 </div>
66 </div>
67 </div>
68 </div>
69 </div>
70 </div>
71 </div>
72 </div>
73 </div>
74 </div>
75 </div>
76 </div>
77 </div>
78 </div>
79 </div>
80 </div>
81 </div>
82 </div>
83 </div>
84 </div>
85 </div>
86 </div>
87 </div>
88 </div>
89 </div>
90 </div>
91 </div>
92 </div>
93 </div>
94 </div>
95 </div>
96 </div>
97 </div>
98 </div>
99 </div>
100 </div>

```

Figure 2: use of native UI controls and accessing native platform

**a. Basenet**

Basenet is a library that takes an image and it cuts the image into the following layer forms: Basic resblock, basic resblock with down sampling, Conv, Conv + BN + ReLU, Conv + BN + ReLU + Bilinear Upsampling, Conv + BN + MaxPool.

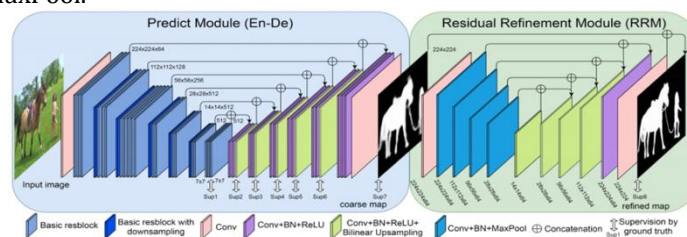


Figure 3: Predict Module and the Residual Refinement Module (RRM) of the basenet library.





ndarray very easy. Processes can access and manipulate NumPy arrays very efficiently as these are stored at one continuous place in memory unlike lists. It is optimized to work with latest CPU architectures as shown in figure 8 NumPy is used in the application for the array manipulation of the array of the coordinates of the image captured in the mobile phone.



Figure 8: NumPy arrays

### e.Screenpoint

It is a library of Python that finds the (x,y)coordinates of the centroid of an image (e.g. a mobile phone camera image)pointing at another image (e.g. a computer screen) using OpenCV SIFT.ScreenPoint is used here to match the coordinates of the image captured in the mobile phone to the coordinates of the laptop screen as shown in figure 9.



Figure 9: Matching coordinates of image in both devices

Once the coordinates match, the image is dropped onto the laptop or computer screen.

### 3. Steps and Observations

The previous methods generally required approximately 5-10 minutes to connect the required device with the system and specifically requires a USB cable and other expensive accessories for scanning or shifting an image as

shown in figure 10. In comparison to this, the same task can be achieved within seconds without the use of any physical device or medium.



Figure 10: Traditional Method

A login page has been built which is the very first thing that the user will come across while using the designed application. Here the user will have to log in using his or her email through google account or the facebook account. Once the user is logged into the application, he or she can access the camera by allowing the designed application to use the camera feature of his or her mobile phone to capture the required image. The same application needs to be installed on the system also to make this transfer possible. As soon as the image is captured in the mobile phone, Pillow library starts working to hold the image within the coordinates so that the object of interest can be extracted. When the image is being held within the mobile screen, OpenCV works to remove the background and extract the Region of Interest (ROI). NumPy also works here as the image is being held within the array which is formed by the coordinates of the image captured.

After successful completion of these two steps, the final image becomes ready on the mobile screen to be transferred now. The local server created through Basenet serves as the intermediary connection between both the devices. Mobile Screen is now placed in front of the laptop screen where ScreenPoint finds the coordinates of the image captured via mobile phone and the coordinates of the laptop screen. Once the coordinates match successfully the image is transferred onto the laptop screen in the same position as on the mobile screen.



Figure 11: Steps of transfer of image

With the bare minimum system requirement of a working laptop/desktop and a smartphone with an adequate camera quality, the designed application shows efficacy by saving the time and performing the transfer without complexity or external devices as shown in figure 11.

#### 4. Results and Conclusions

The issues with the existing methods to make image transfer possible between the mobile phones and the laptop is having to go through the entire process of first connecting all three devices including mobile phone, data cable and the laptop and then after making the necessary setting changes on both the phone and the laptop to make the transfer possible. It is obvious that the existing methodology mandatorily requires to have a physical medium, without which the transfer is not possible. In addition to this, additionally cropping the object of interest out of the entire image takes a little extra time too. This also increases the time taken to do such an easy and small task in more time than desired.

Comparing the previous methods where it generally requires more time connecting the device with the system and specifically requires a USB cable & other expensive accessory, the same task can be achieved within seconds without the use of any physical device or medium.

The region of interest will be automatically cropped out within seconds immediately when the image is captured. All you need is just A Click application as shown in figure 11.

Hence an application has been successfully designed to transfer the image files possible with just the available devices. This does not only remove the external physical medium but it also has reduced the time and effort.

The quality of the image is adequate rendering this application useful for professional purposes also. The server connectivity is streamlined and adequate to make the transfer easy and hassle free.

## 5. Future scope

There is still scope for improvement as there is for every other existent technology. The designed application has been currently tested for some images through which the image quality turned out to be perfectly fine.

The paths have not been met with any kind of hurdle in the process of proving the viability of it quite yet. But further efforts may be done to achieve better results.

## Reference

- [1] "NumPy: Fundamental package for scientific computing with Python". <https://github.com/numpy/numpy>. Accessed on December 2022.
- [2] "Reactnative.dev.Repository" A framework for building native applications using React on <https://github.com/facebook/react-native>. Accessed on Dec 2022.
- [3] Christopher, Chedeau. "A Deep Dive into React Native"(30 January 2015) on YouTube.
- [4] Releases-"Facebook/React".GitHub on <https://github.com/facebook/react>. Retrieved on April 2022.
- [5] Open Source Computer Vision module. Retrieved March 2022 from <https://docs.opencv.org/master/modules.html>
- [6] "Scoped and unscoped packages", Retrieved on April 2022 from <https://Npmjs.com>
- [7] Introduction to Computer Vision using JavaScript. From <https://Towardsdatascience.com>, Retrieved on March 2022.
- [8] NumPy array indexing and slicing. Retrieved on April 2022 from <https://web.archive.org/web/20171224122803/https://docs.scipy.org/doc/numpy-dev/user/quickstart.html>
- [9] Image processing in Python using OpenCV (March 2022). Retrieved from <https://stackoverflow.com>
- [10] 35 Awesome augmented reality examples (June 14, 2009). "Banner Blog News". Retrieved from <http://www.bannerblog.com.au/news/2009/06/35-awesome-augmented-reality-examples.php>
- [11] Milgram, P., Takemura, H., Utsumi, A. and Kishino, F. (1994). Augmented reality: a class of displays on the reality-virtuality continuum in Proceedings of Tele manipulator and Telepresence Technologies (SPIE), 282-292. <https://doi.org/10.1117/12.197321>