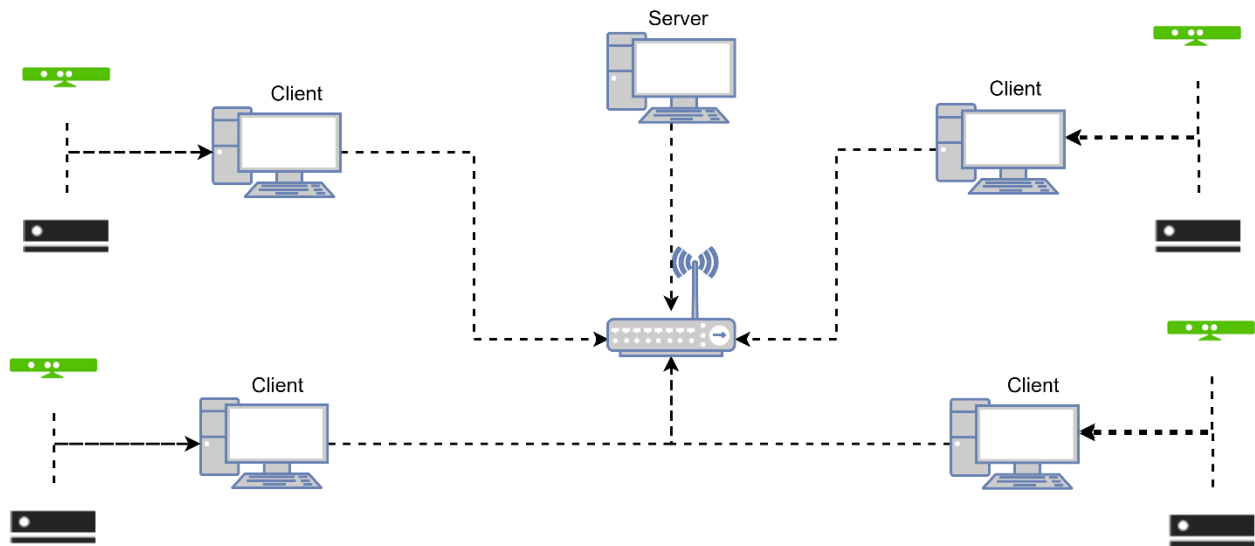


# Multi-Kinect Skeleton Data Record



The package is consisting three following independent solutions in Visual Studio 2017 and written in C#.

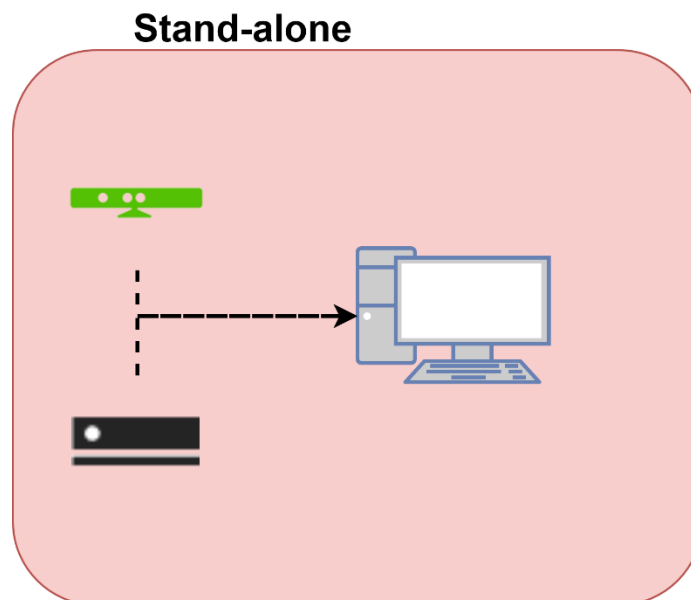
The current application package has following limitations

- 1- Only one skeleton can be tracked or distinguished
- 2- Only skeleton information is being stored
- 3- Each host computer can support only one pair of Microsoft Kinect Xbox 360 and Microsoft Kinect One ( due to limitation in Microsoft Kinect SDKs).

## 1. Operating Modes

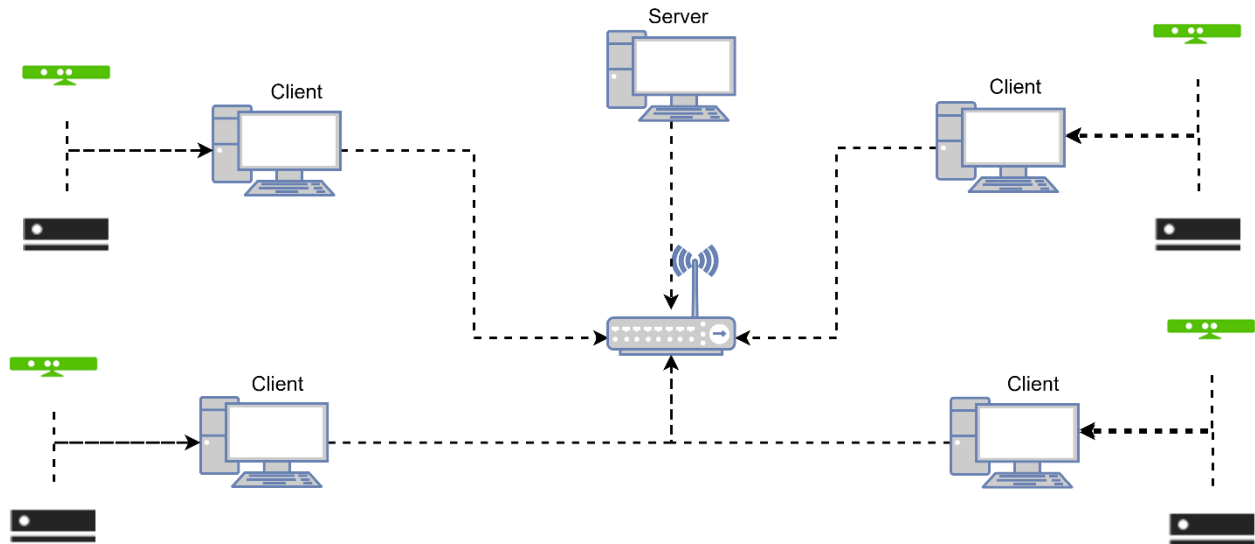
The solution can be utilized in both stand-alone and network synchronized multiple Kinect mode.

In the stand-alone mode the Kinect record can execute independently, and it enables the user to store the joint position automatically in **My Document** folder.



In the multiple Kinect record mode, a server application is responsible to control the recording procedure and provides an integrated simultaneous and synchronized recording. The server application also provides more advanced recording using TCP/IP command and synchronizing the times.

It should be mentioned the captured data will stored in clients drive with the same naming provided by the server. Therefore, a very high bandwidth is not required while the low-latency network ensures better data synchronization.



The server application can use be run on any of clients. However, due to the limitation in Microsoft Kinect SDKs, PC can only run a single Microsoft Kinect v1 and v2.

## 2. Application information

The dependencies and requirement of each package is given below.

### 1. *Microsoft Kinect 1 Record*

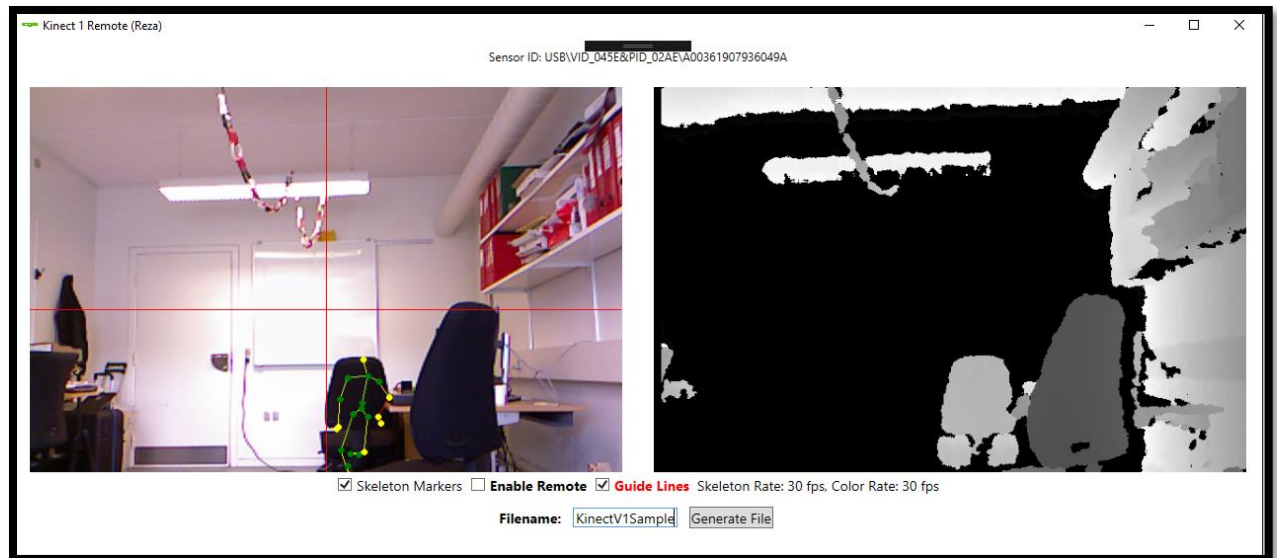
This application illustrates the Microsoft Kinect v1 depth and RGB images while the tracked skeleton and corresponding joints are shown in the RGB images. The application is aimed to store the joint position with least knowledge of programing. The application can operate in both stand alone application and server-triggered data capture.

The installation files are available in **publish** folder of the project.

The application stores the acquired joint position in My Document folder using RS1 file extension. Users can load the stored data into MATLAB by running “**ReadKinect1.m**” file. Each data packet is including the host computer time and of position all 20 predefined joints.

Requirements and dependencies:

- 1- Microsoft Windows 8 and later
- 2- Microsoft Kinect Xbox360
- 3- [Kinect for Windows SDK v1.8](#)
- 4- [Kinect for Windows Developer Toolkit v1.8](#)
- 5- [Microsoft .Net Framework 4.5](#)



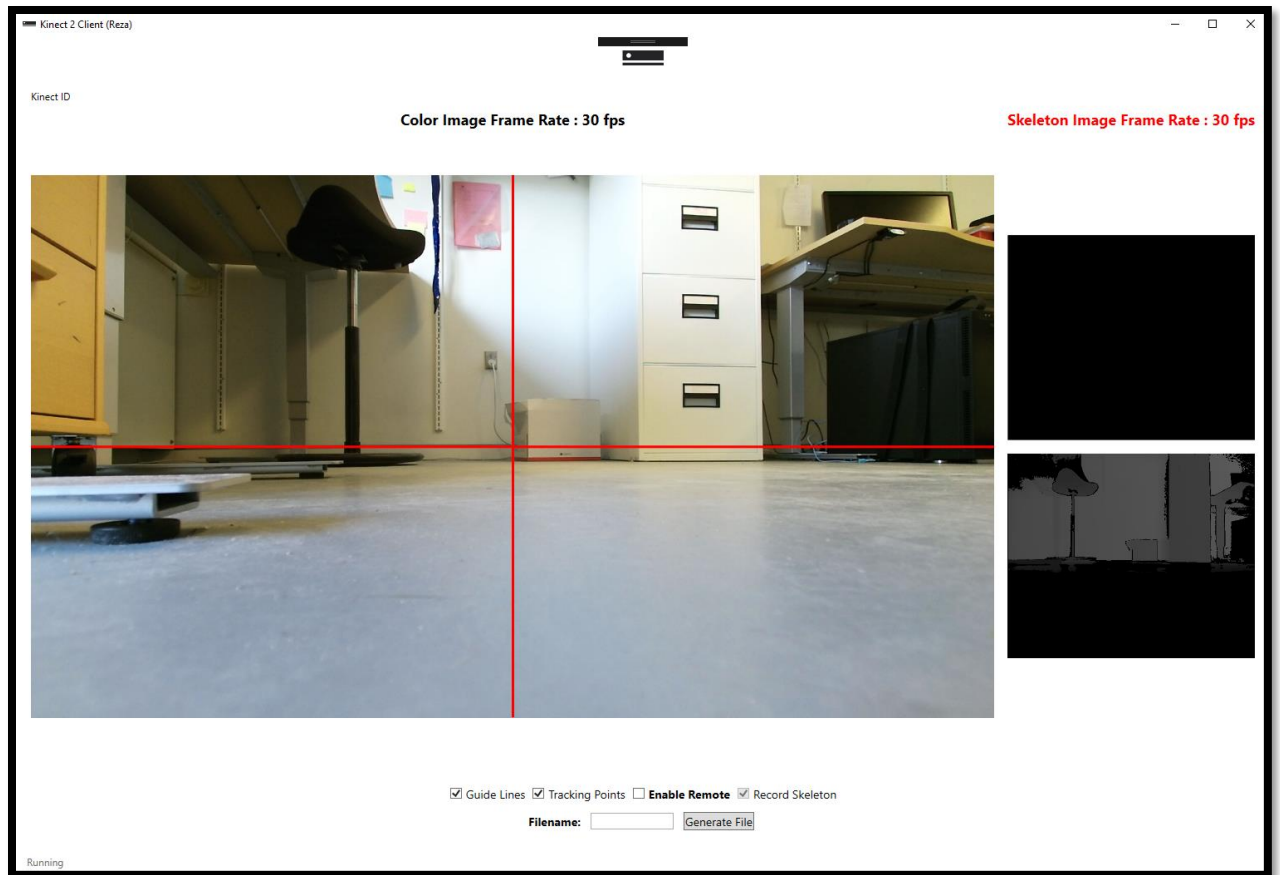
## 2. *Microsoft Kinect 2 Record*

This application enables the users to capture and record tracked skeleton together with the position of all 25 joints presented by Microsoft Kinect SDK v2.0. However, the RGB images and depth information are being shown during the data acquisition; they won't be stored on the host computer. The captured data is being stored in My Document folder and with ks2 file extension. Users can load the record files into MATLAB by running "**ReadKinect2.m**" file.

The installation files are available in **publish** folder of the project.

Requirements and dependencies:

- 1- Microsoft Windows 10
- 2- Microsoft Kinect Xbox One
- 3- [Kinect for Windows SDK v2.0](#)
- 4- [Microsoft .Net Framework 4.5](#)



### *3. Multiple Kinect Sever*

The server application enables the users to capture skeleton data and corresponding joint position using Multiple Kinect sensors. The application is responsible for managing the attached Kinect sensors and trigger the recording simultaneously and provide relevant details for time synchronization by storing time difference between clients.

Server Reza

Please save Subject Info

IP:  Port No:

---

Subject ID:  ☒ Is Healthy

Age:  Gender: ☐ Male ☐ Female

|            | Hand  | Foot  | Eye   |
|------------|---|---|---|
| Dominance: | <input type="checkbox"/> Right<br><input type="checkbox"/> Left | <input type="checkbox"/> Right<br><input type="checkbox"/> Left | <input type="checkbox"/> Right<br><input type="checkbox"/> Left |

Comments:

It should be mentioned all the computers should in the same local network to connect to the server application.

Sever is waiting for clients

IP:  Port No:

192.168.0.155:49273  
AAU804948  
Kinect 1  
Connected  
Time Diff: -17 ms  
Latency: 4 ms

192.168.0.155:49275  
AAU804948  
Kinect 2  
Connected  
Time Diff: -17 ms  
Latency: 4 ms

192.168.0.155:49279  
AAU804948  
Qualisys  
Connected  
Time Diff: -17 ms  
Latency: 4 ms

### 3. References

Naeemabadi M., Dinesen B., Andersen O., Najafi S. and Hansen J. (2018). Evaluating Accuracy and Usability of Microsoft Kinect Sensors and Wearable Sensor for Tele Knee Rehabilitation after Knee Operation. In Proceedings of the 11th International Joint Conference on Biomedical Engineering Systems and Technologies ISBN 978-989-758-277-6, pages 128-135. DOI: 10.5220/0006578201280135

<http://www.scitepress.org/DigitalLibrary/Link.aspx?doi=10.5220/0006578201280135>

<http://www.scitepress.org/Papers/2018/65782/65782.pdf>