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## Introduction to Motion Capture (Rokoko)

My name is Matthew De La Nuez, a recent Digital Multimedia Design graduate who has been using the Rokoko motion/face capture technology in Blender and Unreal Engine. In this course material there will be guidance and tutorials on using the Rokoko suits as well as motion capture tools in general. Motion capture is a powerful technology that has been used by big studios for film, games, and more for over 2 decades. This technology has now started to become more affordable and compact for smaller studios and independent artists to use such as Rokoko motion capture suits. I will be covering suit setup, Blender tutorials/workflow, and Unreal Engine tutorials/workflow but this technology can be difficult to work with especially if you're not tech literate so be aware of this.

## Hosting on Github Pages

1. Fork this repository
2. Create a branch called `gh-pages`
3. Enable Pages to deploy from `gh-pages` branch.
4. Make sure Actions have permission to run on this repo. `gitbook_action.yml` workflow will automatically publish a Gitbook on the `gh-pages` branch.

## Updating a new book

Modify the following files:

- Configuration settings: `book.json`
- Table of contents: `SUMMARY.md`
- `cover.jpg`, `cover_small.jpg` (`cover.jpg` is published as the cover image in the PDF export generated by `.github/workflows/gitbook_action.yml` )
- `LICENSE.md`

## Installing gitbook cli

Requirements: NodeJS v4 and above

```
npm install -g gitbook-cli
```

## Local development

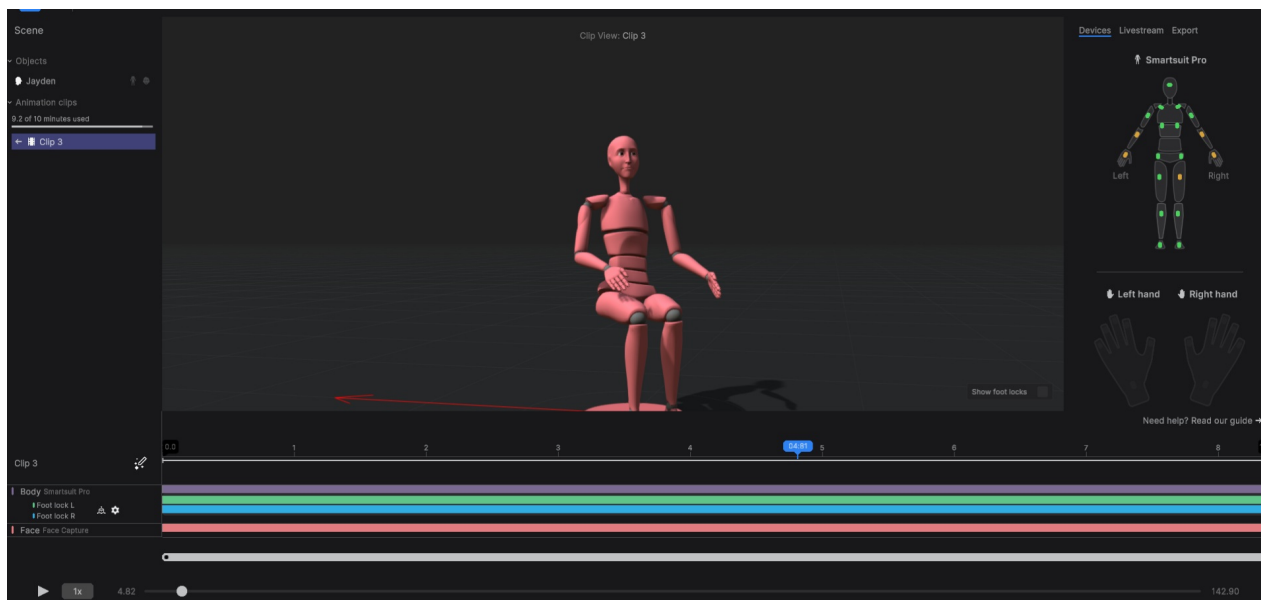
Install local development dependencies: `bundle install`

Install gitbook plugins: `gitbook install`

Build the static website using: `gitbook build`

Build and serve on localhost: `gitbook serve`

**Note:** PDF and eBook files generate via github action, and not the Gitbook generator, therefore, PDF files will be unavailable in local development.



## Chapter 1 (Rokoko Setup)

### Rokoko Suit Setup

When setting up the Rokoko motion capture suits the YouTube setup series made by Rokoko will cover all the general setup instructions for getting started with the suits. All you need to do is download Rokoko Studio from their website and create an account.

<https://youtube.com/playlist?list=PL0nPCZDbYnms3zt1-A1cmf-S1fGyS6Rc3>

Although this covers most of the setup, I will point out a few key factors that are either mentioned in the video only briefly or not at all. Firstly, the motion capture suits use 3 different sensors to be able to work properly which one can be very sensitive to outside forces. This would be the magnetometer which can be easily influenced by magnetic interference caused by metal beams being in walls, technology near the suit, and finally of course magnets. The studio space is an extremely poor recording space for these suits with extreme levels of magnetic interference that degrade the quality of recordings. To check if a room is workable space for the suits, download an EMF reader on your phone which will give you general reading. You should be looking for a room that reads generally 450mG's or lower but can check online with Rokoko to see if this has changed.

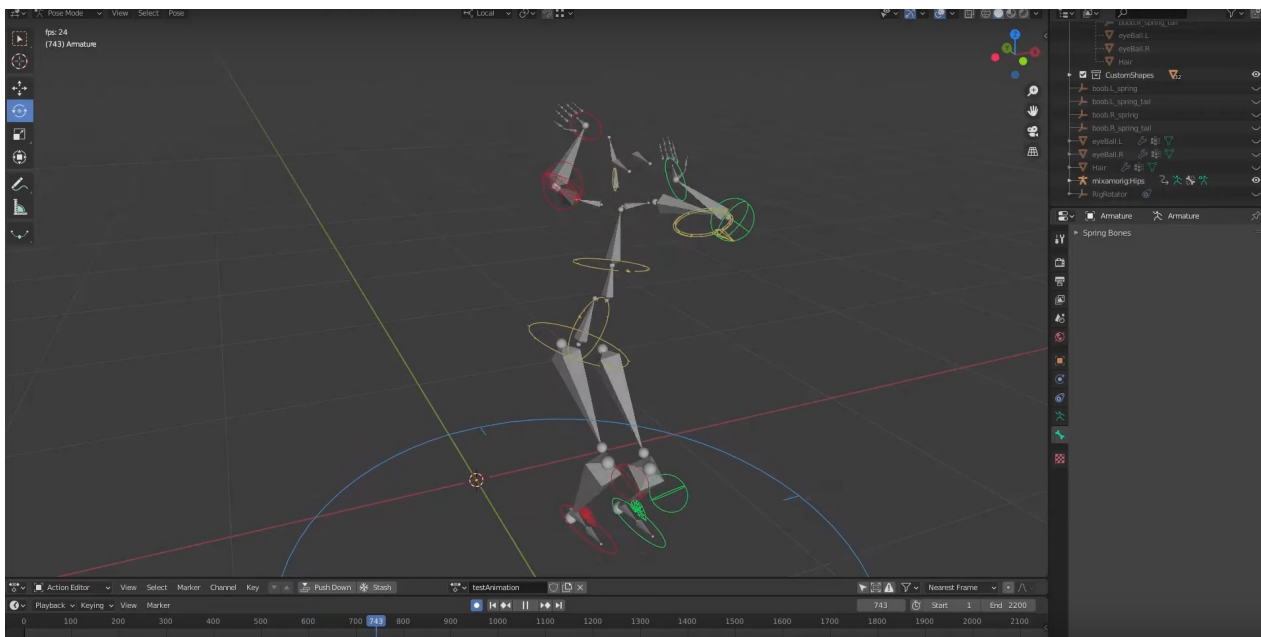
Second, firewall issues when connecting to your Wi-Fi router (no internet over this Wi-Fi). If you're having connection issues where your Wi-Fi settings are getting accepted in Rokoko Studio, but the suit still isn't showing up on the Wi-Fi then check your firewall settings. Your firewall settings should approve these lines of what are in the images below for it to connect properly to Rokoko Studio. If it still isn't connecting to Rokoko Studio even when approving it through the firewall, turn off all connection that is to the internet and try turning off your firewall and windows security to see if it connects with them off. Make sure your computer isn't connected to the internet because your computer will have no security up during this troubleshooting process.

✓ Core Networking Diagnostics - ICMP Ech...	Core Networking Diagnostics	Domain	Yes		
✓ Core Networking Diagnostics - ICMP Ech...	Core Networking Diagnostics	Private...	Yes		
✓ Core Networking Diagnostics - ICMP Ech...	Core Networking Diagnostics	Domain	Yes		
✓ Core Networking Diagnostics - ICMP Ech...	Core Networking Diagnostics	Private...	Yes		
✓ rokoko studio.exe		Private...	Yes	Allow	No
✓ rokoko studio.exe		Private...	Yes	Allow	No

Lastly, damaged sensors or bootloader error with it not applying firmware to sensors. If the sensors on the suit do not light up at all or blinking red on the suit and in Rokoko Studio, then there is a good chance the sensors have died. There are only two backup sensors, one for each suit, which you can replace but please be careful when replacing them as they're not the most durable material. If the sensors are not showing up in Rokoko Studio but are blinking green, then you most likely are running into a bootloader issue. For this you will need

to contact Rokoko Studio support for them to send you a file that can release the sensors from the bootloader issue. I have already run into this issue with both suits and fixed them with the file which the support team said would fix the issue forever but thought I should still bring it up in this documentation.

Rokoko support is based in Europe so take into consideration that they mostly operate from 10pm-11am EST. You can submit a ticket during their off hours, but the responses will only come around those times. If you're using the suits for a project and are having issues, contact support quickly if you can't figure it out in a couple of hours. They're extremely helpful and can even hop on a call with you to troubleshoot any issues you're having.



## Chapter 2 (Blender)

In chapter 2 we will cover how to use Rokoko Studio and the suits with Blender. I am going to link below the Rokoko Official playlist of videos that covers the workflow in Blender, but I will advise to please look at the dates of the videos since they're not the best company to have an organized list of videos with the newest workflows. Make sure you check the description or comments to see if it states that the workflow is outdated with a link to a newer video because I have run into workflow issues to realized it is an outdated video.

<https://youtube.com/playlist?list=PL0nPCZDbYnms56sAz6wWY6wMvS7XXDZmY9>

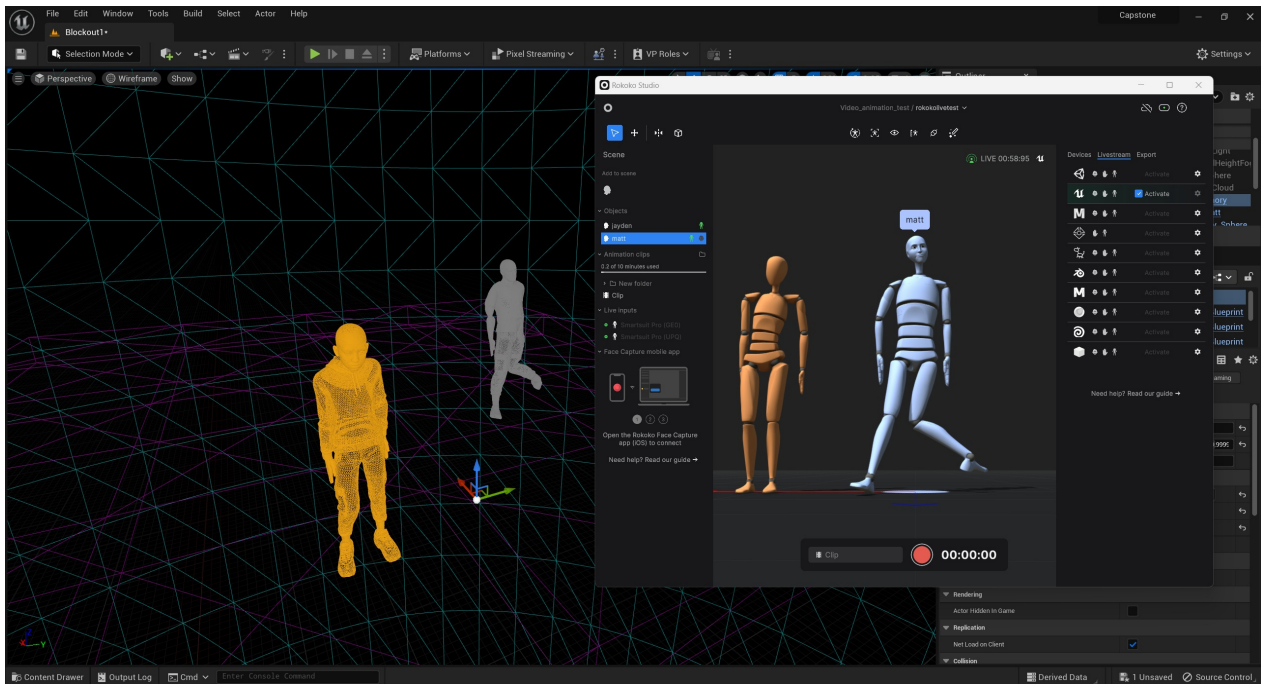
This playlist has videos covering livestreaming the motion capture from Rokoko Studio straight into Blender, but I would highly advise against this workflow because it isn't well developed enough. Also recording in Rokoko Studio gives you access to filters that help improve your motion capture data so at this point it is in your best interest to record in Rokoko Studio and then export using the settings brought up in the videos to another program such as Blender.

This second video is created by a great youtuber who has made informative rigging content. Although this video is a few years old, it covers a good workflow for cleaning up the motion capture data that comes out of Rokoko Studio. I brought up filters that help with the motion capture data within Rokoko Studio but there will always be a need to clean up the motion capture. Make sure you have a good IK rig for the motion capture data because this will determine the quality of the motion capture data in Blender as well as how easy it will be to work with.

<https://www.youtube.com/watch?v=TLdLwbi6OVE>

Lastly, make sure you're not running off the most recent version of Blender unless this version fixes issues for Rokoko Studio that were broken in pervious Blender builds. Too many times I have updated to the newest version of a 3D program only for Rokoko Studio to break completely or the workflow to change significantly because of a bug or new features.

Internal link: [Let's go to Chapter 3](#)



## Chapter 3 (Unreal Engine)

This chapter we will cover Rokoko Studio to Unreal Engine workflow. I will be upfront and say Unreal Engine IS NOT EASY to work in, so you need to make sure you're prepared to take on this program on top of the motion capture bugs and glitches. With that being said, Unreal Engine is an incredibly powerful game engine that can produce incredible results but there will be a large technical learning curve. Since there is a large learning curve and the program has many different feature sets, make sure you narrow down what parts of the engine you need to learn for your project. Lastly, as of writing this Unreal Engine 5 has major bugs and workflow issues so I strongly advise you use version 4.27 for any work you're doing with motion capture.

## Rokoko Guide: Updated Unreal Engine Workflow UE4.26 + UE4.27

<https://www.youtube.com/watch?v=0ZSIEopk5zk&t=0s>

This tutorial should cover how to use the Live Link Plugin to livestream data into Unreal Engine from Rokoko Studio. You will need to purchase a monthly studio license to be able to use the livestream function in Rokoko Studio. Livestreaming isn't completely necessary in most cases of workflows but makes it easier to take a recorded take from Rokoko Studio into UE 4.27 faster. This tutorial also uses Metahuman which is a powerful character creation tool free through Unreal Engine/Epic Games. Although this isn't necessary, you can use your own characters and create a rig using Mixamo so that you can use it in Unreal Engine. If you're going to use Metahuman characters, then you will NEED the below files for it to work for livestreaming.

## Bone Maps

[https://drive.google.com/drive/folders/1mfpaVIB0lluFLyQosoIU07gPoCOs\\_O4H](https://drive.google.com/drive/folders/1mfpaVIB0lluFLyQosoIU07gPoCOs_O4H)

## Other Tutorials

For Unreal Engine motion capture you can go down a rabbit hole of technical videos and workflows that can be easily overwhelming even for people who know their way around Unreal Engine. Below I am going to link a mix of highly technical tutorials as well as beginner tutorials for different workflows/situations. Again, please make sure to check the date of the tutorials and versions of the tools being used in the video so that you know it is a viable workflow to use.

Beginner: [https://youtu.be/nJYTWGbV69U? https://youtu.be/nJYTWGbV69U? https://youtu.be/IDFLrzZy2R4? https://youtu.be/sOuRxFlfPGk?](https://youtu.be/nJYTWGbV69U?https://youtu.be/nJYTWGbV69U?https://youtu.be/IDFLrzZy2R4?https://youtu.be/sOuRxFlfPGk?)

Advanced: [https://www.youtube.com/watch?v=E9TpcxtqTEk& https://youtu.be/9kIPixG8GHA? https://youtu.be/FOVG43ErtTM? https://youtu.be/jkBg4wI1wqg?](https://www.youtube.com/watch?v=E9TpcxtqTEk&https://youtu.be/9kIPixG8GHA?https://youtu.be/FOVG43ErtTM?https://youtu.be/jkBg4wI1wqg?)

Internal link: [Let's go to Chapter 4](#)





## Chapter 4 (Face/Video Capture)

For this chapter we will cover face capture and video capture that are big features of Rokoko Studio. These two features do not require the suit, but the face capture requires a license you need to pay for. The video capture is 100% free and a fun way to dip your toes into the motion capture technology. I highly suggest starting with video capture to have some fun and see how you enjoy the technology and see if it's viable for your project's needs. Video motion capture is a little janky right now, but I still see it as a tool that has a low bar to entry.

Face capture on the other hand is a topic that could be expanded on greatly in complexity. The face capture in Rokoko Studio like the suits, is a powerful tool but, needs a lot of hand tuning and fixing to fully work. Plus, you will need to pay for the studio license and a face capture license to start using this technology in Rokoko Studio. There are other iPhone apps such as Unreal Engines Live Link that are completely free and can be used in Unreal Engine or another 3D program such as Blender. I would recommend a free face capture app first to see if this technology interests you because it will give you similar results to the Rokoko face capture.

## Rokoko Face Capture Tutorial

<https://youtube.com/playlist?list=PL0nPCZDbYnmsev1BwTT-gl.2kBpxdUYYLO>

## Rokoko Video Tutorial

<https://youtu.be/ZpCKukrtSsU?t=1>