

# ***Being faster than in Real-Time***

**Jakob Fehle, David Halbhuber, Jonathan  
Sasse**

Lehrstuhl Medieninformatik

**FAKULTÄT FÜR SPRACH-, LITERATUR- UND  
KULTURWISSENSCHAFTEN**



Universität Regensburg

## Being faster than in Real-Time

- Predicting avatar movement in VR
  - Increase UX
  - Increase immersion of body perception
  - Tackle latency
- Apply prediction to virtual Avater
- Recent work shows feasibility of this approach [1]

- [1] Huy Viet Le, Valentin Schwind, Philipp Göttlich, and Niels Henze. 2017. PredicTouch: A System to Reduce Touchscreen Latency using Neural Networks and Inertial Measurement Units. In Proceedings of the 2017 ACM International Conference on Interactive Surfaces and Spaces (ISS '17). ACM, New York, NY, USA, 230-239. DOI: <https://doi.org/10.1145/3132272.3134138>

# Environment

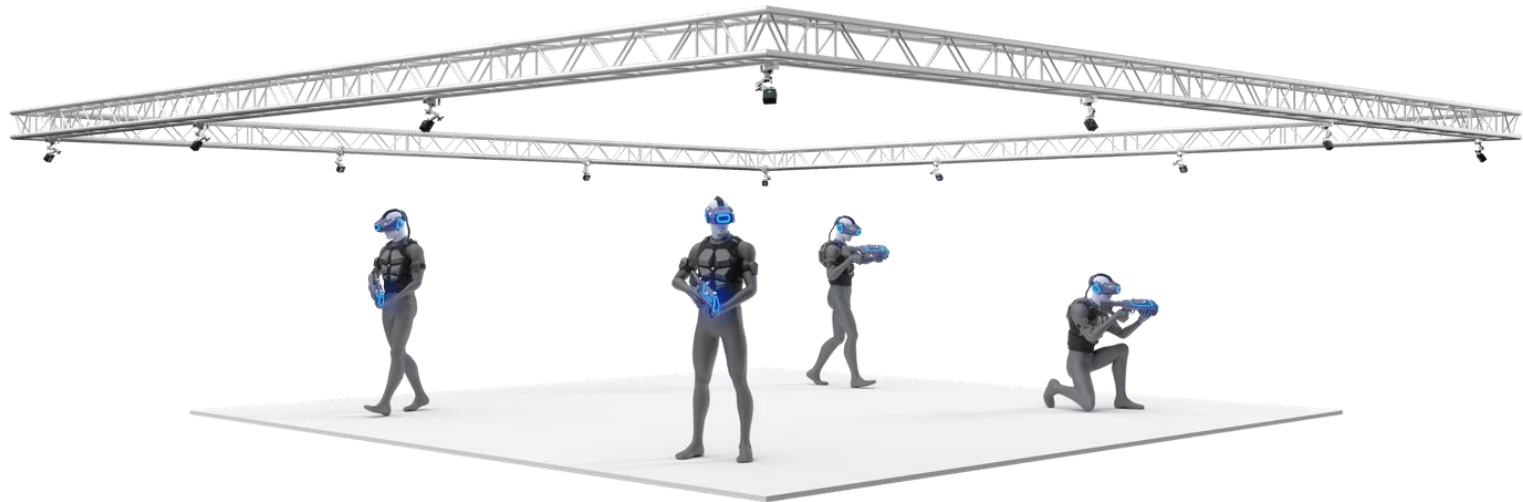


Image source: <https://optitrack.com/>

# Environment



Image source: <https://unity.com/>



Image source: <https://optitrack.com/>

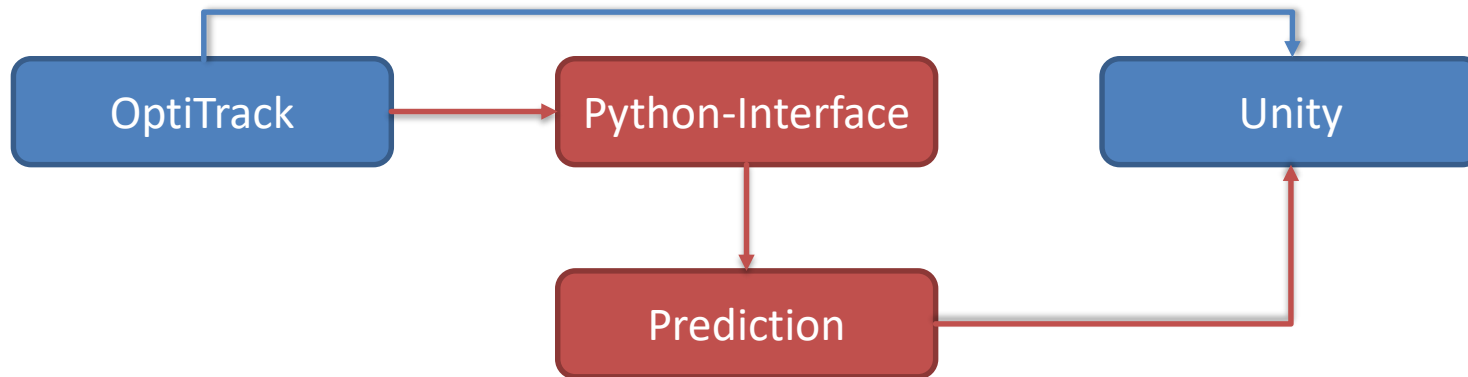


Image source: <https://tensorflow.org/>



Image source: <https://python.org/>

# Problem Statement



- Research question boils down to:
  - Is it possible to increase user performance/ immersion by predicting movement using NN?
  - Quantify it!

## Methods: Step 1

- Analyzing which data we actually need
- Collect motion capturing data

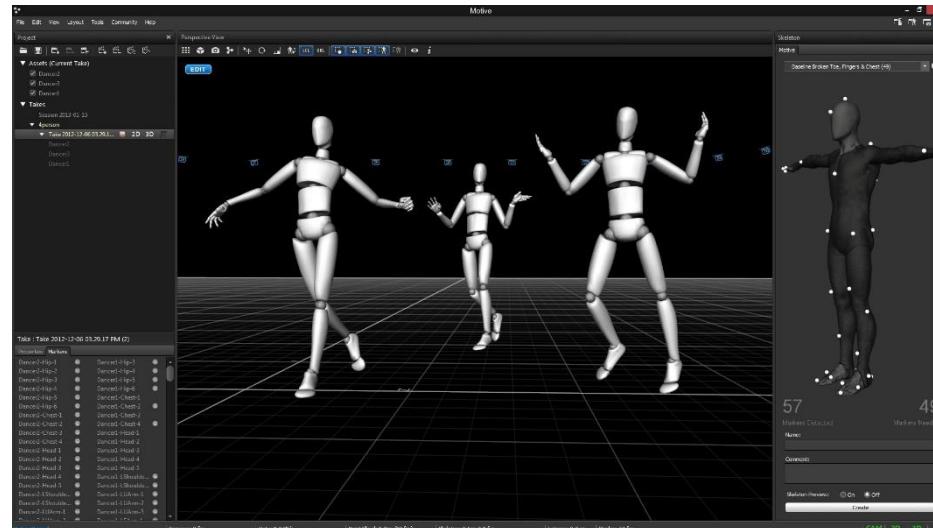
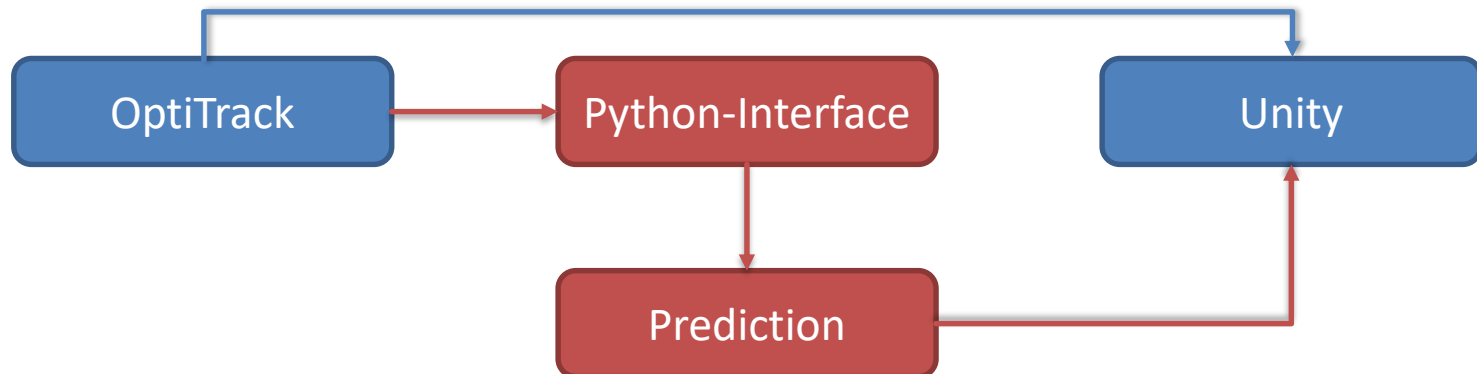


Image Source: <https://optitrack.com/>

## Methods: Step 1

- Designing a python application to intercept data between OptiTrack and Unity



## **Methods: Step 2**

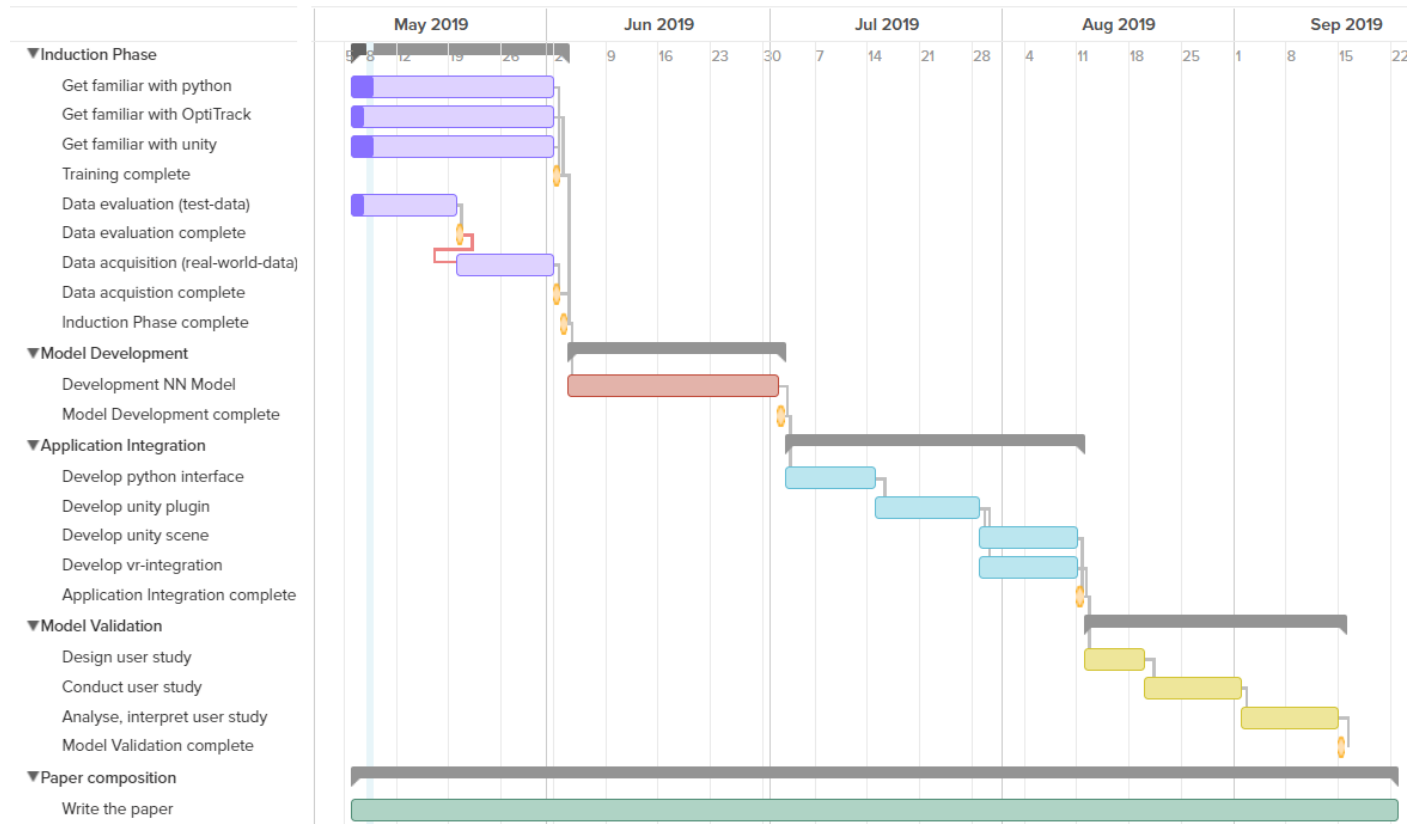
- Creating and training the neuronal network models
- Validating predictions with already gathered data
- Tuning of the hyperparameters
- Creation of a Unity application to display the data collected via motion capturing and adapted with the help of the NN



## **Methods: Step 3**

- Conducting user study for performance measuring
  - Level of presence
  - Limb ownership

# Project Plan



## User Stories

- As **user** I want to move in VR without latency to have a realistic experience
- As **developer** I want to create a VR without latency in order to ensure an optimal immersion
- As **scientist** I want to monitor the effects of latency on the users' immersive experience in VR in order to compare various latency levels with those of various users
- As **scientist** I want to measure the effects of latency towards the users' performance in VR in order to quantify those.

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project plan

Due by May 09, 2019
 Last updated 1 day ago

Evaluate and create an approximate project schedule

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data evaluation

Due by May 19, 2019
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evaluate data that are required for the project

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induction phase

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data acquisition

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# GitHub


## project plan

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Evaluate and create an approximate project schedule


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 ☐

 choose project plan type **organizational**


#3 opened a day ago by Cele3x

☐

 create project plan **organizational**

#1 opened a day ago by Cele3x  2 of 5

☐

 create project introduction presentation **organizational**

#2 opened a day ago by Cele3x

# GitHub

## create project plan #1

🔔 Open

Cele3x opened this issue a day ago · 1 comment



Cele3x commented a day ago • edited ▼

### Tasks

- ☒ set project milestones
- ☐ write user stories (issues)
- ☐ assign issues to milestones
- ☐ prioritize and estimate time for issues
- ☒ date milestones



Cele3x added the **organizational** label a day ago

# GitHub

🔒 project organization  
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🔍 Filter cards

1 To Do

- 📌 write user stories  
 #10 opened by Cele3x

4 In Progress

- 📌 choose project plan type  
 #3 opened by Cele3x  
 organizational
- 📌 create project plan  
 2 of 5  
 #1 opened by Cele3x  
 organizational
- 📌 create project introduction presentation  
 #2 opened by Cele3x  
 organizational
- 📌 analyze requirements  
 #9 opened by Cele3x

1 Review

- 📌 create gantt chart  
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0 Done

**Vielen Dank  
für Ihre Aufmerksamkeit!**

