

TALLINN UNIVERSITY OF TECHNOLOGY

Faculty of Information Technology

Department of Software Science

Allar Viinamäe, 163578 IAPM

**DATA DRIVEN GYMNASTICS SKILLS  
RECOGNITION AND ANALYSIS**

Master's thesis

Supervisors: Sven Nõmm, PhD

Tallinn 2020

TALLINNA TEHNIKAÜLIKOOL

Infotehnoloogia teaduskond

Allar Viinamäe, 163578 IAPM

**ANDMEPÕHINE VÕIMLEMISOSKUSTE  
TUVASTUS JA ANALÜÜS**

Magistritöö

Juhendajad: Sven Nõmm, PhD

Tallinn 2020

## **Author's declaration of originality**

I hereby certify that I am the sole author of this thesis. All the used materials, references to the literature and the work of others have been referred to. This thesis has not been presented for examination anywhere else.

Author: Allar Viinamäe

17.04.2020

# Contents

<b>List of Figures</b>	<b>2</b>
<b>List of Tables</b>	<b>3</b>
<b>1 Introduction</b>	<b>4</b>
1.1 Human Activity Recognition Background . . . . .	5
1.1.1 Human Activity Types . . . . .	5
1.1.2 Recognition Types . . . . .	5
1.2 Problem statement . . . . .	5
1.3 Related work . . . . .	5
<b>2 Implementation</b>	<b>6</b>
2.1 Implementation overview . . . . .	6
2.2 Infrastructure and Tools . . . . .	6
2.2.1 Client Infrastructure and Tools . . . . .	6
2.2.2 Back-end Server Infrastructure . . . . .	6
2.2.3 Research and development . . . . .	6
2.3 Data acquisition . . . . .	6
<b>3 Data pre-processing</b>	<b>7</b>
3.1 Data description . . . . .	7
3.2 Drawing Entity . . . . .	7
3.2.1 Outlier removal . . . . .	7
3.2.2 JSON to Drawing entity Conversion . . . . .	7
<b>Bibliography</b>	<b>9</b>

# List of Figures

# List of Tables

# Chapter 1

## Introduction

Introduction...

## 1.1 Human Activity Recognition Background

### 1.1.1 Human Activity Types

### 1.1.2 Recognition Types

## 1.2 Problem statement

## 1.3 Related work



# Chapter 2

## Implementation

### 2.1 Implementation overview

### 2.2 Infrastructure and Tools

#### 2.2.1 Client Infrastructure and Tools

Hardware

Software

#### 2.2.2 Back-end Server Infrastructure

Software

#### 2.2.3 Research and development

### 2.3 Data acquisition

# Chapter 3

## Data pre-processing

### 3.1 Data description

### 3.2 Drawing Entity

#### 3.2.1 Outlier removal

#### 3.2.2 JSON to Drawing entity Conversion

# Acknowledgments

# Bibliography