

Project Plan and Specificatijon

**Meal Detection and Carbohydrate Estimation from
Continuous Glucose Monitoring data**

THONY PRICE

Master in Computer Science

Date: October 24, 2018

Supervisor: Pawel Herman

Examiner: -

Swedish title: Detta är den svenska översättningen av titeln

School of Electrical Engineering and Computer Science

Abstract

About this document...

Diabetes is on the rise... Proper care comes from good data... Diet is of major concern... CGM allows easy data collection... Meal detection is... Carbohydrate estimation...

Contents

1	Introduction	1
1.1	Research Question	2
1.2	Scope	2
1.2.1	Purpose	2
1.2.2	Limitations	2
2	Background	3
2.1	Glossary	3
2.2	Diabetes	3
2.2.1	Definition	3
2.3	Tool 1	3
2.4	Tool 2	3
2.5	Tool 3	4
2.6	Previous Work	4
3	Methods	5
3.1	Data	5
3.2	Implementation	5
3.3	Evaluation	5

Chapter 1

Introduction

In every country the disease burden related to diabetes is high and on the rise [4]. In 2017 the estimated prevalence of diabetes was 451 million people globally and approximately 5 million deaths were attributed to diabetes [3]. Besides mortality, diabetes increase the risk of heart disease, stroke, peripheral vascular diseases along with overall reduced life expectancy [4]. With these factors in mind, along with a projected prevalence of 693 million diabetes patients in 2045, proper medical care for diabetes are of utmost importance [3].

Diabetes is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both [2]. Insulin is necessary to maintain normal blood glucose levels by facilitating cellular glucose uptake and regulating carbohydrate metabolism [6]. The vast majority of cases of diabetes fall into two broad categories, type 1 and type 2. Type 1 is caused by an absolute deficiency of insulin secretion, thus patients need to induce exogenous insulin on a regular basis to balance maintain balanced blood glucose levels [2].

Today no cure of diabetes exists but self management by patients can improve the long term outcome. Self management actions include activities such as eating patterns, exercise, alcohol and carbohydrate consumption [1]. Patients.2

[Brief section on A1C value as indicator of patient's situation]. Medical care guidelines put emphasis on diet and lifestyle factors to improve

the A1C value [5]. Commonly a specialist works with weekly measurement to assess the current development of a patient and derives recommendations from that. [Rewrite this paragraph...]

Continuous glucose monitors (CGMs) are wearable devices that measure the blood glucose frequently. The usability offers a larger dataset to evaluate a patient's fluctuations of glucose values. The

CGM's potential to improve treatment...

1.1 Research Question

Text...

1.2 Scope

1.2.1 Purpose

From a study performed by Steady health unique CGM data will be available...

1.2.2 Limitations

The data is collected from various devices...

In vitro tests of recommendations is not included in the study...

Therefore evaluation is performed on PODOVA..?

Chapter 2

Background

2.1 Glossary

Include here...

2.2 Diabetes

2.2.1 Definition

Text...

2.3 Tool 1

Text...

2.4 Tool 2

Text...

2.5 Tool 3

Text...

2.6 Previous Work

Chapter 3

Methods

3.1 Data

Text...

3.2 Implementation

Text...

3.3 Evaluation

Text...

Bibliography

- [1] . “4. Lifestyle Management: Standards of Medical Care in Diabetes 2018”. In: *Diabetes Care* 41.Supplement 1 (2018), S38–S50. ISSN: 0149-5992. DOI: 10.2337/dc18-S004.
- [2] American Diabetes Association. “Diagnosis and Classification of Diabetes Mellitus”. In: *Diabetes Care* 33.Supplement 1 (2010), S62–S69. ISSN: 0149-5992. DOI: 10.2337/dc10-S062.
- [3] N. H. Cho et al. “IDF Diabetes Atlas: Global estimates of diabetes prevalence for 2017 and projections for 2045”. In: *Diabetes Research and Clinical Practice* 138 (Apr. 2018), pp. 271–281. ISSN: 0168-8227. DOI: 10.1016/j.diabres.2018.02.023.
- [4] Nita Gandhi Forouhi and Nicholas J. Wareham. “Epidemiology of diabetes”. In: *Medicine (Abingdon)* 42.12 (Dec. 2014). 25568613[pmid], pp. 698–702. ISSN: 1357-3039. DOI: 10.1016/j.mpmed.2014.09.007.
- [5] Matthew C. Riddle. “American Diabetes Association. Standards of Medical Care in Diabetes”. In: *Diabetes Care* 40.7 (2017), e92–e93. ISSN: 0149-5992. DOI: 10.2337/dc17-0299.
- [6] Gisela Wilcox. “Insulin and insulin resistance”. In: *Clin Biochem Rev* 26.2 (May 2005). PMC1204764[pmcid], pp. 19–39.