

StormMind

AI based Web-Service for Storm Damage Prediction

Bachelor Thesis

ZHAW School of Engineering
Institute of Computer Science



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Declaration of Authorship

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I have no limitations.
— Thomas Shelby

To our parents...

Abstract

Extreme weather events cause considerable damage to infrastructure, the economy and the environment worldwide. Predicting such damage can help to optimize preventive measures and reduce costs. In this project, a neural network is being developed that analyzes historical weather data and damage reports to predict potential storm damage in Switzerland based on new weather forecasts. Using modern machine learning techniques, relevant patterns are recognized in order to train a predictive model. The model is tested for accuracy and optimized to enable reliable predictions.

Key words: Machine Learning, Neural Network, Storm Damages



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Preface

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Key words:

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1 Introduction

1.1 Motivation

Why do we do this?

1.2 Work Outline

What do we want to predict etc.

2 Theoretical Background

2.1 Weather Research

2.1.1 Reason for Flooding

- Drought Followed by Heavy Rain
- Snowmelt in Spring

2.1.2 Reason for Landslide

- Slope, Water, Soil Condition

2.2 Machine Learning

2.2.1 Neural Networks

2.2.2 Long Short Term Memory Neural Networks

2.2.3 Sequence to One Neural Networks

2.2.4 Feature Engineering

2.2.5 Validation

2.3 Software Engineering

3 Methodology

3.1 AI Engineering

3.1.1 Data

3.1.2 Data Cleaning

3.1.3 Deep Learning Model

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3.2.1.1 Technologies

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3.2.2.1 Technologies

3.2.3 Test Concept

4 Results

4.1 Prediction Results

4.2 Software Results

5 Discussion and Outlook



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