

Bachelor's Thesis Supervisor's Expert Opinion

Student: Wang Yanghua
 Student Number: E200106
 Title of Bachelor's Thesis: Predicting IoT-based Traffic in Smart Cities using Neural Networks
 Aim of the Thesis: To propose and validate an IoT-based traffic forecasting system based on neural networks.
 Thesis Supervisor: prof. Ing. Petr Hájek, Ph.D.
 Study Programme: Informatics and System Engineering
 Academic Year: 2022/2023

Difficulty of the Topic

	Excellent	Very good	Satisfactory	Unsatisfactory	Cannot be evaluated
Theoretical knowledge	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Input data and their processing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methods used	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Thesis Evaluation Criteria

	Excellent	Very good	Satisfactory	Unsatisfactory	Cannot be evaluated
Degree of achievement of the aim of the thesis	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Original attitude to the topic processing	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Adequacy of the methods used	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Depth of analysis (relative to topic)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Logical structure of the thesis and scope	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Working with Czech and foreign literature including citations	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Formal arrangement of the thesis (text, charts, tables)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Language level (style, grammar, terminology)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Naposledy vytištěno 31.7.2023 12:31

Applicability of the Results of the Thesis

	High	Medium	Low	Cannot be evaluated
For theory	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
For practice	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Other Comments on the Thesis

The bachelor thesis is a challenging work that aims to leverage neural networks in predicting urban traffic. The thesis is successful in achieving its stated aim. The student meticulously utilizes neural networks to predict IoT-based traffic patterns, a topic of significant relevance in the contemporary context of smart city development. The originality of the work is commendable, as it merges the domains of IoT, smart cities, and neural networks in a meaningful way. The methods used for the study are appropriate and align well with the objectives. The use of neural networks for predicting patterns is a sound choice, considering the complexity of IoT traffic data. However, a deeper analysis of both the neural network structures and the effects of input parameters would be needed to better understand the behaviour of the trained model. The work is logically structured, with each section seamlessly transitioning into the next, facilitating the reader's understanding. The use of references is thorough, contributing to the overall academic rigor of the work. In terms of presentation, the thesis adheres to standard academic conventions and is written in clear, formal language. The formal presentation of the work is good, with several typos and faulty links to figures and tables. Overall, this bachelor thesis is a good contribution to the field, paving the way for further explorations into the intersection of smart cities, IoT, and neural networks.

Comments on the Outputs from the Theses System

Assessed – not plagiarized, the highest degree of compliance – 3%.

Questions and Suggestions for Defence

1. Characterize the traffic behaviour patterns at the studied intersections, are they representative?
2. What other input variables from IoT sensors could be used to further refine the neural network model?

Final Evaluation

I **recommend** the thesis for the defence.
 I propose to grade this Master's thesis as follows: **C**

In Pardubice 31.7.2023

Signature