

Report Introduction

Template note: this document is intended to form the beginning of your eventual Self-Learning Report document. In this initial submission you will be writing about the things you are expected to have discovered when selecting your tool: its primary tool domain, the link it has to your personal goals, a justification for why you have chosen it, your search for resources, and information on your domain of application.

Anything in italics (like this) you should read as instructions, but not include in your own report.

You should stick to the required headings - they are what your marker is going to be looking for to answer key questions. You may add your own subheadings if you wish.

While this template is in markdown, your submission will be PDF. It is perfectly fine if you want to generate this from Markdown, or if you want to use Word, Pages, LaTeX, or anything else this is perfectly fine, but you must submit a PDF at the end. The style is not a concern, it is the headings and content that is important.

Chosen Tool - PyTorch

PyTorch ---- PyTorch is an open source machine learning library based on the Torch library, used for applications such as computer vision and natural language processing, primarily developed by Facebook's AI Research lab (FAIR). It is quite useful in the deep learning field

Justification

Because Pytorch has a wide range of applications in both machine learning and deep learning. Although artificial intelligence is not the scope of my undergraduate studies, I want to work in this field in the future, so it is necessary to learn it in advance. Learning PyTorch will serve as a self-learning foundation for me to learn other tools. Although there is a lot of pre-requisite knowledge that I don't know about PyTorch (including some mathematical theories, basic concepts of neural networks, etc.), I think I should be able to catch up on this pre-requisite knowledge while learning PyTorch.

Resource Search

I searched the web for many different sources, including the PyTorch website, the kaggle database, YouTube videos, paperbacks, and official tutorials. I believe that these materials will be enough to complete my self-study tasks for the semester (from level 1 to level 4), and will support me in my deeper studies.

*Domain of Application - Education and Traffic Management

In fact, there are many applications that use PyTorch. For example, my Level 1 application is a program that recognizes handwritten characters. This program will be useful in the educational domain, for example, if a student or a tutor uses an iPad to write numbers by hand, this program can convert it to text format very well. My level 4 application is a car plate recognition, which will be useful in traffic management, for example, to help identify the car plates of illegal vehicles.

References

You must use APA 6th edition for your references. The use of a reference manager like Mendeley or Zotero is recommended. You are expected to use citations to back up your arguments for at a minimum: what your tool is and other information about it, and information regarding your domain of application. And of course you should reference the resources you mention in your Resource Search section.

INFO1111 2021 Sem 1 : Self-Assessment Instrument

Individual Strengths and Needs + Planning

Student Name Yuxiang Zheng
Unikey yzhe3356

Enter the **three strengths** that you believe you have that are most significant to your ability to work in the computing field.

Analytical ability
Problem-solving ability
Critical-thinking ability

Enter the **three area for further development** that you believe are most important in improving your ability to work in the computing field.

Creativity
Resilience
self-learning

Previous Experience, etc.

Prove a brief outline of your previous experience

None

Additional notes

Enter here any additional explanatory notes regarding these strengths and weaknesses and how they should be interpreted.

As a computer data science student, Analytical ability is one of the most important abilities that I have to learn. There are many cases and data in the computing field for our to analyse, and we need to give many different solutions that fit the situation. Problem-solving ability also be an essential skill. Because we always meet some complex questions and we need to convert some concept into reality. Critical thinking is significant in any field, especially in computer science. We will hear many different ideas, different solutions and different methods, thus, it is really important for us to critically think about which one of more efficient.

In the computing field, creativity is an ability that everyone should have. The problems that we face are always no so essay, so we have to provide some creative cases or solutions before we finish a task. One of the facts of the computing field is we can not always successful for the first time, for example, you will attempt many fails in programing. Thus, try to be more resilient and humble when we face failures is very important. That is not doubted at self-learning skills are quite essential whatever the major you are learning. Even I have the basic ability to learning by myself, I still think it is a weakness for me.

Career Ambitions

Provide a brief summary of your career ambitions

I'm gonna learn machine learning and deep learning, and work in the AI field. Google is my favourite company in the computing field, and I want to be an engineer in Google.

Plan for undertaking development

Area 1:

Creativity

Analysis of the need

Try to think about more cases and solutions before start working.

Plan for undertaking development

Do more exercise

Area 2:

Resilience

Analysis of the need

be humble, resilient and determined when I face to failures

Plan for undertaking development

Do more exercise

Area 3:

self-learning

Analysis of the need

learn how to complete a task without other's helps and learn how to search for resources quicker and efficient.

Plan for undertaking development

Do more exercise

Resource	Link	Notes
Pytorch web	https://pytorch.org/	basic methods, official tutorial
Numpy	https://numpy.org/	some syntax, functions or examples of using numpy
Kaggle	https://www.kaggle.com/datasets	useful datasets
Tensorflow	https://www.tensorflow.org/	basic information of Tensorflow

Self-learning topic proposal				
	Primary/Computing Tool	Data Science		
	Domain of Application	Deep learning		
	Topic:	PyTorch		
	Description	PyTorch is an open source machine learning library based on the Torch library, used for applications such as computer vision and natural language processing, primarily developed by Facebook's AI Research lab (FAIR).		
	Why is this relevant:	As computational data science and mathematic student, I wish to work in machine learning, deep learning and artificial intelligence area, so Pytorch should be one of the most important frameworks that I have to learn.		
	Why will this be beneficial?	This is the most popular deep learning framework tool in the AI area.		
		Outcomes	Description of what will be delivered	Included Artifact
	Level 1 - Basic Application	I will be able to create an application of hand-write number recognition.	A report describes the knowledge, method, theory and flow path. I will describe other areas that I can use PyTorch, what I still don't know and the limitation of PyTorch.	A link of the application of hand-write number recognition
	Level 2 - Basic Knowledge	I will be able to describe some basic theory of deep learning, application of mathematics (e.g. operation of matrices, inverse matrix, partial derivatives of matrices and counter propagation etc.) and some extension library of python (e.g. NumPy and pandas etc.).	A report (in addition to Level 1 content) including a SWOT analysis of PyTorch as applied to the AI domain. It will describe situations in deep learning where PyTorch is useful and where it is not, and explain why this is the case.	
	Level 3 - Advanced Application	I will be able to create an application of a car number plate recognition.	A report (in addition to Level 2 content) describing some deeper apply of PyTorch.	A link of application of a car number plate recognition
	Level 4 - Advanced Knowledge	I will be able to compare and contrast PyTorch with alternative Tensorflow. I will be able to discuss and demonstrate the different paradigms of these different deep learning framework, and show how to achieve similar goals using them.	A report (in addition to Level 3 content) comparing and contrasting these different deep learning framework in some real case. This report will be written as a tutorial for a new learner. A demonstration showing different ways to achieve similar goals in PyTorch and Tensorflow, based on the concepts from levels 1, 2, and 3.	
	Next step	I will select a real project that some company face in the deep learning field and using my existing skills to solve the issues.	Try to find some sources of deep learning, such as in Leetcode	