DR. ALVIN'S PUBLICATIONS

HOW TO PERFORM SIMPLE FACIAL RECOGNITION ON PHOTOS USING PYTHON BY 'TECH WITH TIM'

A SUMMARY BY DR. ALVIN ANG



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STEP 1 – INSTALL PYTHON (64 BIT)

THIS ARTICLE IS BASED ON THE WORK BY TIM (2019)¹

Two ways to get Python 3.7.5 (*Must* be 64 bit):

- 1. From Dr. Alvin's Website
 - Go to <u>http://www.alvinang.sg/publications-1</u>
 - Scroll down the page all the way
 - Under "Data Science / AI Work" section, you will see it.
 - Download and install.
- 2. From Python's Website
 - Go to https://www.python.org/downloads/windows/
 - Scroll around and look for "Download Windows x86-64 executable installer"
 - Or simply click the link below:
 - <u>https://www.python.org/ftp/python/3.7.5/python-3.7.5-amd64.exe</u>
 - Download and install.

¹ <u>https://www.youtube.com/watch?v=D5xqcGk6LEc</u>

STEP 2: DOWNLOAD THE CODE

- Facial Recognition Code Name = face_rec.zip
- Two ways to get it:
 - 1. From Dr. Alvin's Website
 - Go to <u>http://www.alvinang.sg/publications-1</u>
 - Scroll down the page all the way
 - Under "Data Science / AI Work" section, you will see it.
 - Download and extract onto **Desktop**.
 - 2. From Tim's Website
 - Go to <u>https://techwithtim.net/face_rec/</u>
 - Download and extract onto **Desktop**.

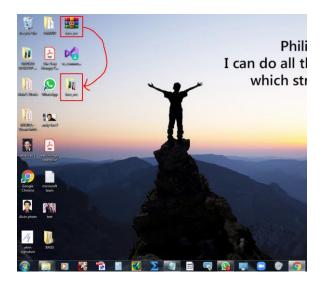


Figure 1: Download and Extract "face_rec.zip" unto Desktop

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STEP 3: DOWNLOAD AND INSTALL VISUAL STUDIO

DOWNLOAD MICROSOFT VISUAL STUDIO COMMUNITY EDITION (2019)

Two ways to get it:

- 1. From Dr. Alvin's Website
 - Go to <u>http://www.alvinang.sg/publications-1</u>
 - Scroll down the page all the way
 - Under "Data Science / AI Work" section, you will see it.
 - Download but don't install yet.
- 2. From Microsoft Visual Studio Download Page
 - Go https://visualstudio.microsoft.com/downloads/?utm_medium=microsoft&ut m_source=docs.microsoft.com&utm_campaign=button+cta&utm_content=do wnload+vs2019+rc
 - Download **but don't install yet**.

Downloads			
Visual Studio 2019		-	
Version 16.5	Community	Professional	Enterprise
Release notes >	Powerful IDE, free for students, open-source	Professional IDE best suited to small teams	Scalable, end-to-end solution for teams of a
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Figure 2: Download Microsoft Visual Studio Community Edition 2019

INSTALL MICROSOFT VISUAL STUDIO COMMUNITY EDITION (2019)

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Figure 3: Select Desktop Development with C++

• Installation will take some time – then you will come to this page (Figure 3).

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- Select Desktop Development with C++ \rightarrow Then click Install
- It will take long! (6GB to install)
- Once done, **RESTART** your laptop

STEP 4: RUN PIP INSTALL

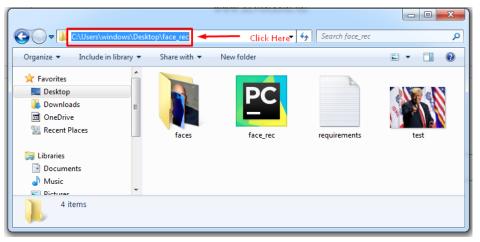


Figure 4: Go to the folder where you have unzipped the face_rec folder

- After Restarting you laptop, go to the folder where you unzipped the 'face_rec.zip' (Figure 4)
- Click on the top bar....

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Figure 5: Type in CMD and press Enter

• Then retype "cmd"

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Figure 6: CMD prompt

- You will be brought to the C:\ command prompt the folder of the 'face_rec'
- At this point, ensure that your Python version is 64 bit.

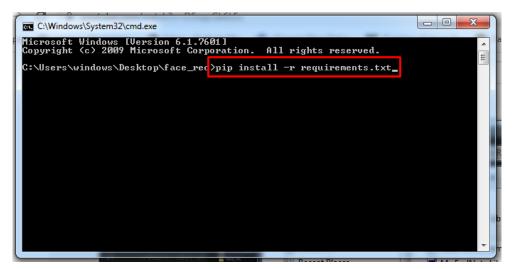


Figure 7: Type in the pip install command

- At the command prompt, type in "pip install -r requirement.txt".
- If everything is smooth, you will see it installing
- But most probably you will run into a problem (see the next section).

PROBLEMS WITH PIP INSTALL COMMAND

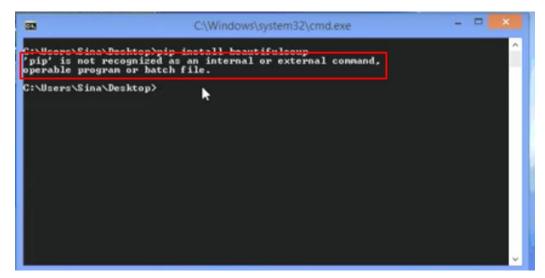


Figure 8: pip is not recognized

- After you try running 'pip install' command, most probably you will run into this problem
 - "pip is not recognized as an internal or external command, operable program or batch file"

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Figure 9: Where did you install your Python?

• Following Figure 9, go and find where you had previously installed your Python.

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👰 Computer	NEWS 1	15-Oct-19 12:14 AM	Text Document	695 KB
🏭 Windows (C:)	🌄 python	15-Oct-19 12:12 AM	Application	98 KB
	🚳 python3.dll	15-Oct-19 12:12 AM	Application extens	58 KB
📬 Network	🚳 python37.dll	15-Oct-19 12:12 AM	Application extens	3,662 KB
	📴 pythonw	15-Oct-19 12:12 AM	Application	97 KB
	🚳 vcruntime140.dll	14-Oct-19 11:04 PM	Application extens	88 KB

Figure 10: Double click and open the folder

		The Schulzer In		-
C:\Users\windows\Ap	pData\Local\Programs\Python\Python37\Scripts	Click here	and copy the v	vhole thing
Organize 👻 Include in library 👻	Share with 🔻 New folder			
🔆 Favorites	Name	Date modified	Туре	Size
📃 Desktop	鷆pycache	20-Apr-20 3:42 PM	File folder	
🗼 Downloads	boost	20-Apr-20 6:30 PM	File	1 KB
🖬 OneDrive	ᢙ chardetect	20-Apr-20 6:30 PM	Application	101 KB
🕮 Recent Places	🙋 cmake	20-Apr-20 8:14 PM	Application	101 KB
	🙋 cpack	20-Apr-20 8:14 PM	Application	101 KB
词 Libraries	ᢙ ctest	20-Apr-20 8:14 PM	Application	101 KB
Documents	🙋 easy_install	20-Apr-20 11:36 AM	Application	101 KB
🎝 Music	径 easy_install-3.7	20-Apr-20 11:36 AM	Application	101 KB
Pictures	🔁 f2py	20-Apr-20 4:11 PM	Application	101 KB
📑 Videos	🔁 face_detection	20-Apr-20 8:23 PM	Application	101 KB
	径 face_recognition	20-Apr-20 8:23 PM	Application	101 KB
🖳 Computer	ᢙ iptest	20-Apr-20 3:42 PM	Application	101 KB
🏭 Windows (C:)	🔁 iptest3	20-Apr-20 3:42 PM	Application	101 KB
	ᢙ ipython	20-Apr-20 3:42 PM	Application	101 KB
🗣 Network	🔁 ipython3	20-Apr-20 3:42 PM	Application	101 KB
	ᢙ isonschema	20-Apr-20 3:42 PM	Application	101 KB

Figure 11: Click on the top bar and copy it (Ctrl + C)

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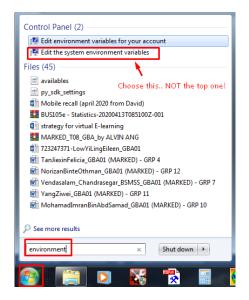


Figure 12: Go to start, type "environment"

- Go to start, type in 'environment' \rightarrow At the top, the control panel will appear
- Choose "Edit the **SYSTEM** environment variables".

omputer Name Hardv	ware Advanced	System Protection Remote
You must be logged o	n as an Administra	tor to make most of these change
Performance		
Visual effects, proces	ssor scheduling, m	emory usage, and virtual memory
		Settings
User Profiles		
Desktop settings rela	ated to your logon	
		Settings
Startup and Recover	y	
System startup, syste	em failure, and deb	ugging information
		Settings
		Environment Variables.

Figure 13: A System Properties will pop up - Click on Environment Variables

ystem variables	
New Edit Del	
ystem variables	elete
ystem variables	elete
Variable Value	^
Path C:\Program Files (x86)\Intel\CLS Client\	с
PATHEXT .COM: EXE: BAT: CMD: VBS: VBE: 35:	
PUBRAND Pavilion	
Patform MCD	

Figure 14: At the System Variables box, find the variable 'Path", then click Edit

Variable name:	Scroll to the end ant type semi-cold
Variable value:	UPT;C: Program Files (x86) (Skype Phone (

Figure 15: A pop up will appear, go to 'Variable Value' and scroll all the way to the END; then type in a semi-colon;

	Edit System \	/ariable	×
Variable name:	after semicolor	n, paste (ctri ;	+ V) the folder path
Variable value:	am Files (x86)	(Skype)Phon	IC: Python27
		OK	Cancel

Figure 16: After semicolon, Ctrl + V to paste the Python's Script folder location

• After Figure 16, just keep clicking OK until all the 'Environment System Variables' close.



Figure 17: After System Variable has been added, close the *current* CMD prompt

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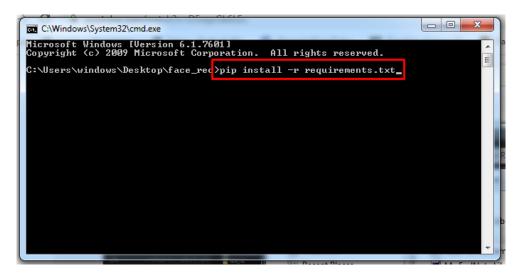


Figure 18: Type in the pip install command

- Go back to Figure 6 and re-open a new CMD prompt.
- At the command prompt, type in "pip install -r requirement.txt" (Figure 18).

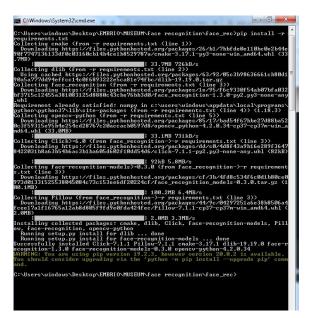


Figure 19: Pip install... takes VERY long!

- Figure 19 shows the pip installing. Take note: it takes a very long time.
- Please do not close the Command Prompt while it is installing... just be patient.

STEP 5: RUN THE FACE RECOGNITION PROGRAM (THRU PYTHON)

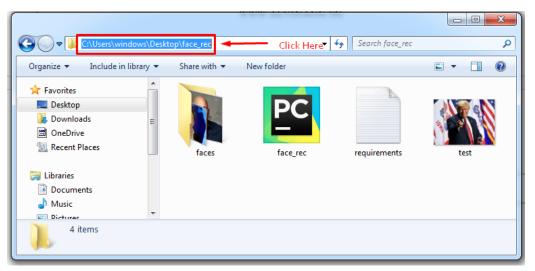


Figure 20: Go to the folder where you have unzipped the face_rec folder

- Go to the folder where you unzipped the 'face_rec.zip' (Figure 20)
- Click on the top bar....

Cond cmd	• Type in CMD and press Enter	✓ → Search face_rec	- • • × •
Organize Search for "cmd"	, All		•
Desktop Desktop Downloads Downloads Recent Places	faces face_rec	requirements	test
Libraries Documents Music Dicturee			
4 items			

Figure 21: Type in CMD and press Enter

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Figure 22: CMD prompt

• You will be brought to the C:\ command prompt – the folder of the 'face_rec'

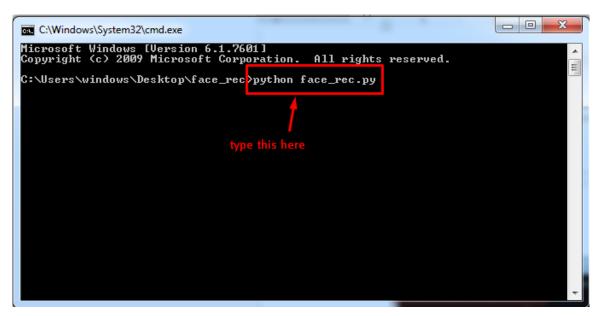


Figure 23: Type in 'python face_rec.py'

- Type in 'python face_rec.py'
- If you are lucky, the program runs well.
- Else, you will face another problem (See next section)

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PROBLEM RUNNING PYTHON AT CMD PROMPT

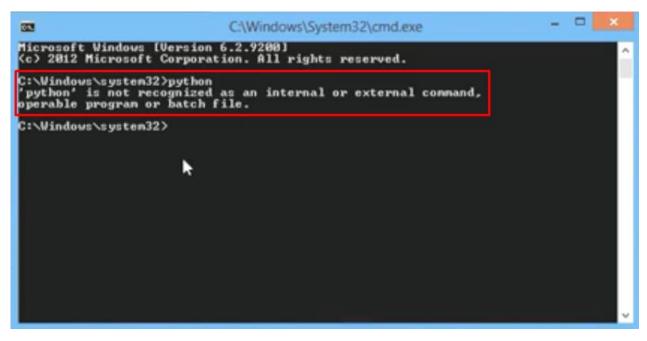


Figure 24: Problem running Python at CMD Prompt

- If you can't run Python at the Command Prompt, kindly refer to the section (much earlier) on "Problems with Pip Install Command" on Page 11 \rightarrow Just follow the same steps.
- **BUT**, do not double click the 'Scripts' folder (do NOT open it) \rightarrow Figure 25

G O ♥ L ► Computer ► Windows (C:) ► Users ► windows ► AppData ► Local ► Programs ► Python ► Python37 ►							
🚖 Favorites	Name	Date modified	Туре	Siza			
📃 Desktop	🐌 DLLs	20-Apr-20 11:36 AM	File folder				
🐌 Downloads	🌗 Doc	20-Apr-20 11:36 AM	File folder	A A A A A A A A A A A A A A A A A A A			
🖬 OneDrive	퉬 etc	20-Apr-20 3:42 PM	File folder	Simply click here and Copy			
🔄 Recent Places	퉬 include	20-Apr-20 11:36 AM		(Ctrl + N _C			
	퉲 Lib	20-Apr-20 11:36 AM	File folder	Just copy the link to the			
🥽 Libraries	🌗 libs	20-Apr-20 11:36 AM	File folder	Python folder will do			
Documents	DO NOT Open this folder	20-Apr-20 8:23 PM	File folder				
🁌 Music	share open uns torder	20-Apr-20 3:42 PM	File folder				
Pictures	퉬 tcl	20-Apr-20 11:36 AM	File folder				
Videos	鷆 Tools	20-Apr-20 11:36 AM	File folder				
		15-Oct-19 12:14 AM	Text Document	30 KB			
🖳 Computer	NEWS	15-Oct-19 12:14 AM	Text Document	695 KB			
🏭 Windows (C:)	🌄 python	15-Oct-19 12:12 AM	Application	98 KB			
	🚳 python3.dll	15-Oct-19 12:12 AM	Application extens	5 58 KB			
📬 Network	🚳 python37.dll	15-Oct-19 12:12 AM	Application extens	3,662 KB			
	🛃 pythonw	15-Oct-19 12:12 AM	Application	97 KB			
	🚳 vcruntime140.dll	14-Oct-19 11:04 PM	Application extens	88 KB			

Figure 25: Do NOT Double click and open the folder

- Simply click on the top bar and just copy it (just copy the direct Python folder will do).
- Subsequently, follow the steps in Figure 12 (Page 13)



Figure 26: After semicolon, Ctrl + V to paste the Python's Script folder location

- After Figure 26, just keep clicking OK until all the 'Environment System Variables' close.
- Go back to Figure 23 and run the program.

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Figure 27: Final Output

• If all goes well, Figure 27 is what you will see \rightarrow a blue box around the face with the name.

STEP 6: HOW TO USE THE PROGRAM

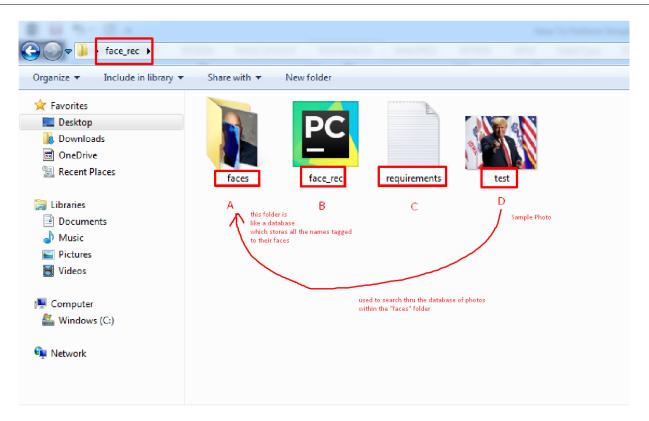


Figure 28: 4 Items in the 'face_rec' Folder

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A. FACES FOLDER = DATABASE OF PHOTOS WITH NAMES

• Referring to Figure 28, the 'faces' folder, if we open it up, this is what we see.

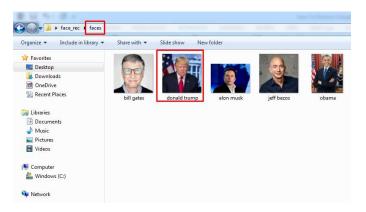


Figure 29: Inside the 'faces' folder

- You can see that the 'test' photo in Figure 28 is Donald Trump.
- In other words, the purpose of the 'faces' folder (Figure 29) is a *Storage Place* where the program can use it to search for all the relevant face and photos.

B. FACE_REC = THE PYTHON PROGRAM

• The "face_rec.py" is the Python program which we use to run (thru the command prompt)

C. REQUIREMENTS = NEEDED FOR PYTHON TO RUN

- Recall section "Step 4: Run PIP Install" on page 9.
- This "requirements.txt" file is used to notify which "C++ packages" are required to be installed into Python before it can run.

D. TEST = SAMPLE PHOTO WITHOUT NAME

- This is the *Sample Photo* which you use to search through the "faces" folder for the name.
- In other words, presume you have a photo but you don't know the name of the face.

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- Replace "test" with your new photo and rename it "test".
- If the person's photo is inside the "faces" folder with his name, it will retrieve and display hi name on your "test" photo for you.

REFERENCES

Tim, T. W. (2019). "Python Face Recognition Tutorial w/ Code Download." from https://<u>www.youtube.com/watch?v=D5xqcGk6LEc</u>.

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ABOUT THE AUTHORS

Tim is a first year computer science student that has a passion for programming and everything tech! Teaching and writing guides is his favorite past-time. More about him at https://techwithtim.net/

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