



MRC Cognition
and Brain
Sciences Unit



UNIVERSITY OF
CAMBRIDGE

Harnessing Visual Studio Code

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MMM – March 4, 2024

Data analysis environment

Scripting tools



Terminal



BASH
&
Shell Scripts



python™



jupyter



R



MATLAB®

Essential features



Debugging



Version control



Coding assistance



Variable explorer



Plot display

Sharing & Collaborating



GitHub



GitLab

Documentation & Reports



Let's Markdown!

L^AT_EX

Data analysis environment

Scripting tools



Integrated Development Environment

Essential features



Debugging



Version control

(IDE)



Coding assistance



Variable explorer



Plot display

Sharing & Collaborating

A code editor with features like coding assistance, debugging tools, and an integrated terminal, which makes it easy to write, test, and debug code within a single interface

Documentation & Reports



Let's Markdown!

Ideally, for multiple languages

Preferred IDE

- Stack Overflow Developer Survey 2023

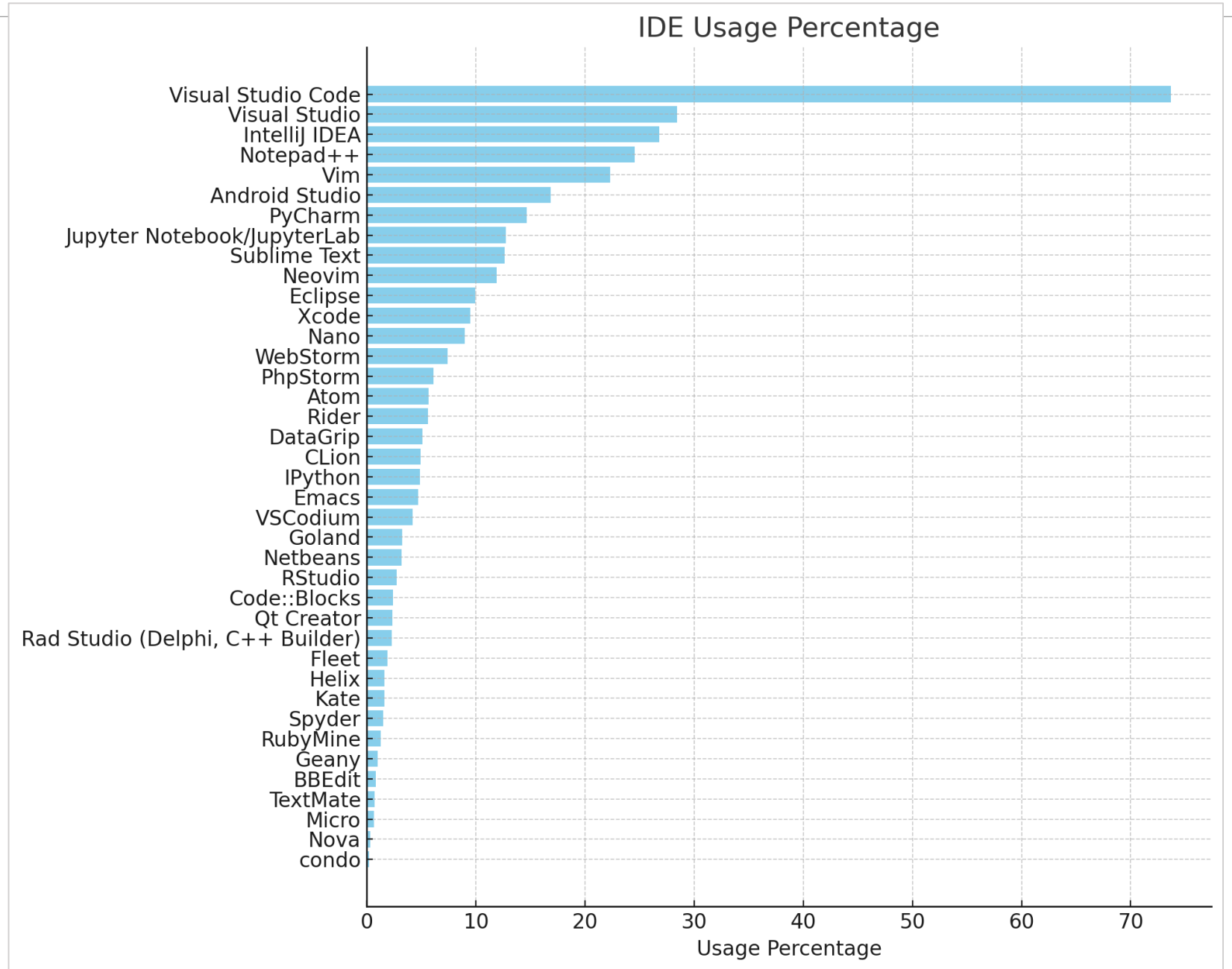
<https://survey.stackoverflow.co/2023/#most-popular-technologies-new-collab-tools>

- “Which development environments did you use regularly over the past year, and which do you want to work with over the next year? Please check all that apply.”

- 86,544 responses



VS Code 73.71%



Preferred IDE

- Stack Overflow Developer Survey 2023

<https://survey.stackoverflow.co/2023/#most-popular-technologies-new-collab-tools>

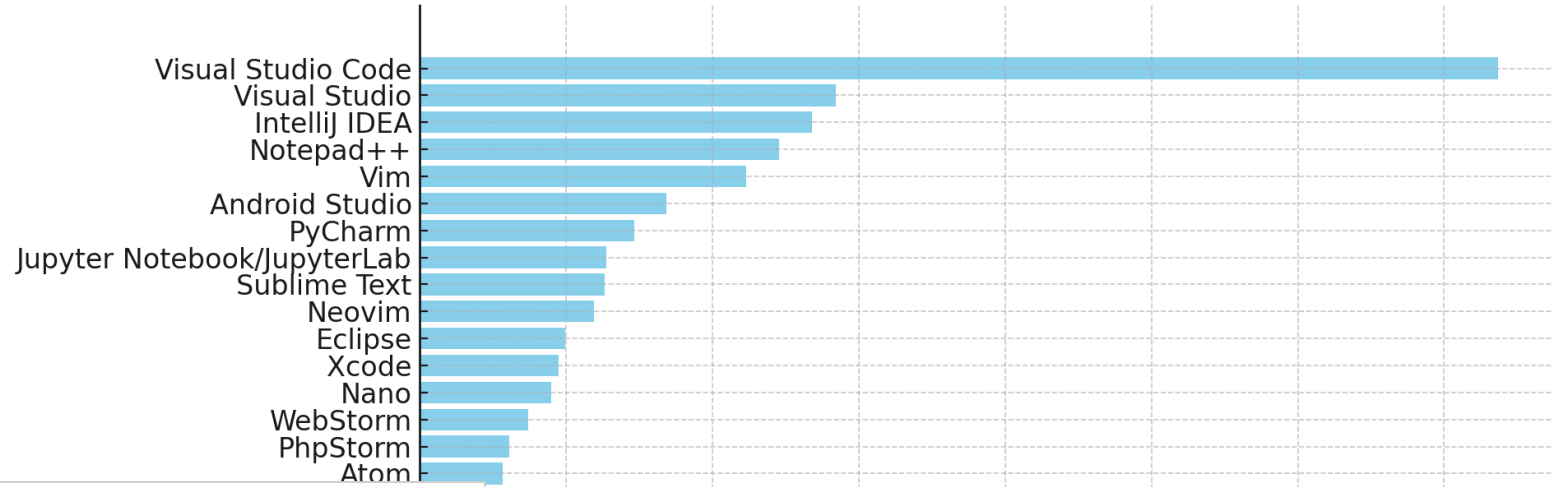
- “Which development environments did you use regularly over the past year, and which do you want to work with over the next year? Please check all that apply.”

- 86,544 responses

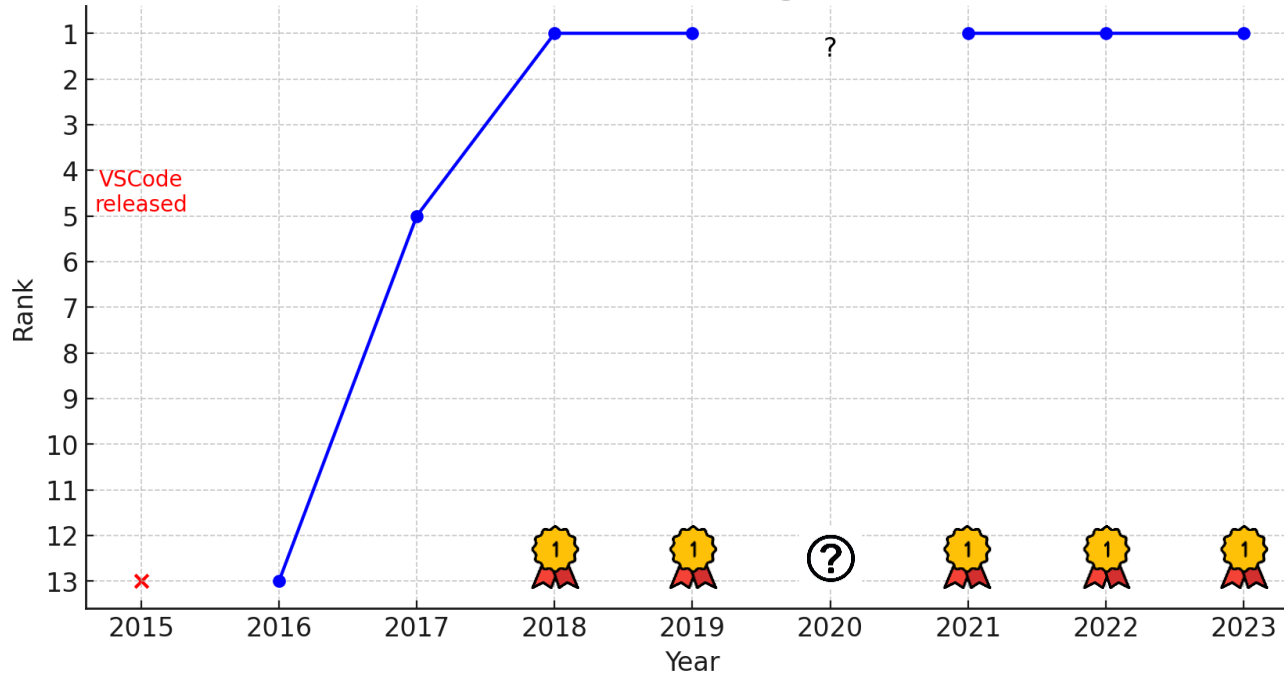


VS Code 73.71%

IDE Usage Percentage



Visual Studio Code Ranking Over the Years



Usage Percentage

Visual Studio Code (VS Code)

- A **free, open-source** IDE by Microsoft, launched in April 2015
- **Cross-Platform Support:** available on Windows, macOS, and Linux
- **Lightweight and Fast**
- **Multi-Language Support:** support for almost every major programming language (hundreds)
- **Customisable:** allows users to tailor their development environment to their needs, from themes and keyboard shortcuts to more complex workflow configurations
- **Extendable:** an extensive library of extensions allows one to tailor the IDE to specific use cases (out of the box would make for a bloated piece of software, instead it takes a modular approach)
- **Version Control Integration:** the built-in support for Git
- **Support for Collaboration:** e.g., through Git and Live Share
- **Rich Ecosystem:** loads of support through community forums, tutorials, and documentation

Visual Studio Code (VS Code)

- VS Code's combination of performance, flexibility, and community support makes it an invaluable tool for researchers across disciplines
- Whether for coding experiments, analysing data, or writing up findings, VS Code offers a versatile platform that can adapt to various needs, enhancing productivity and collaboration

Coding (Python)

File Edit Selection View Go Run Terminal Help

fmri (Workspace) [SSH: login-j02]

You are connected to an OS version that is unsupported by Visual Studio Code. [Learn More](#)

Name	Type	Size	Value
adjustment_factc	Series	(4,)	subject
adjustment_factc	DataFrame	(4, 2)	subject adjust
aovrm	AnovaRM		<statsmodels.s
ax	Axes		Axes(0.125,0.1'
df_adj	DataFrame	(12, 5)	subject b
fig	Figure		Figure(700x500
grand_mean	float64		2.5124945
layer_dir	str	83	'/imaging/corr
layer_profile	DataFrame	(15, 4)	0 1 2
layer_profile_file	str	142	'/imaging/corr
mc	MultiCom		<statsmodels.s
mean_values	ndarray	(15,)	[0.932002 1.74
number_of_layer:	int		15
p	float64		0.03877420783
res	AnovaRes		Anova
results	DataFrame	(4, 16)	subject layer_
results_binned	DataFrame	(4, 4)	subject Dee
results_binned_lc	DataFrame	(12, 3)	subject b
results_long	DataFrame	(60, 3)	subject layer :
row_data	dict	4	{'subject': 'sub-
row_data_list	list	4	[{'subject': 'sub
save_path	str	135	'/imaging/corr
stat	float64		6.5
stats_type	str	7	'z_score'
subject	str	6	'sub-04'
subject_means	Series	(4,)	subject
subjects	list	4	['sub-07', 'sub-

```

29 # Get all subjects
30 subjects = [
31     subject for subject in os.listdir(layer_dir)
32     if os.path.isdir(os.path.join(layer_dir, subject)) and subject.startswith('sub
33 ]
34
35 # Print the list of subjects
36 print(subjects)
37
38 (function) def print(
39     *values: object,
40     sep: str | None = " ",
41     end: str | None = "\n",
42     file: SupportsWrite[str] | None = None,
43     flush: Literal[False] = False
44 ) -> None
45
46 Prints the values to a stream, or to sys.stdout by default.
47
48 sep
49 string inserted between values, default a space.
50
51 end
52 string appended after the last value, default a newline.
53
54 stats_type}.txt"
55
56 try:
57     layer_profile = pd.read_csv(layer_profile_file, header=None, sep=r"\s+")
58     mean_values = layer_profile.groupby(0).mean().loc[:, 1].values
59
60 # Create a dictionary for the row and append it to the list
61 row_data = {'subject': subject}
62 row_data.update({f'layer_{i}': mean_values[i - 1] for i in range(1, number_
63 row_data_list.append(row_data)
64
65 except FileNotFoundError:
66     print(f"File not found: {layer_profile_file}")
67
68 except pd.errors.EmptyDataError:
69     print(f"Empty or invalid data: {layer_profile_file}")
70
71 # Create the results DataFrame from the list
72 results = pd.DataFrame(row_data_list)
73
74 # Make long format
75 results_long = pd.melt(results,
76     id_vars='subject',
77     value_vars=[f'layer_{i}' for i in range(1, number_of_layers
78     var_name='layer',
79     value_name=stats_type)
80
81 # Remove 'layer_' from the layer column
82 results_long['layer'] = results_long['layer'].str.replace('layer_', '')
    
```

Interactive-1 x

Interrupt | X Clear All | Restart | Variables | Save | ... | fmri (Python 3.12.2)

... <ipython-input-1-dc04a7896eb0>:187: FutureWarning: The behavior of DataFrame.results_binned = pd.concat([results_binned, pd.DataFrame([row_data])],

... rFFA Initial vs Repeated Faces layer profiles (N = 4)

... Anova

```

=====
F Value Num DF Den DF Pr > F
-----
bin 6.3995 2.0000 6.0000 0.0325
=====

Multiple Comparison of Means - Tukey HSD, FWER=0.05
-----
group1 group2 meandiff p-adj lower upper reject
-----
Deep Middle 2.3708 0.0319 0.2224 4.5193 True
Deep Superficial 1.802 0.1004 -0.3465 3.9505 False
Middle Superficial -0.5688 0.7473 -2.7173 1.5797 False
-----
    
```

Type 'python' code here and press ctrl+enter to run

SSH: login-j02 | main* | 2 hrs 32 mins | Git Graph | You, 3 days ago | R: (not attached) | Ln 69, Col 33 | Spaces: 4 | UTF-8 | LF | Python 3.12.2 64-bit

Coding (R)

File Edit Selection View Go Run Terminal Help

workshops (Workspace) [SSH: login-j02]

You are connected to an OS version that is unsupported by Visual Studio Code. [Learn More](#)

WORKSPACE

- Attached Namespaces
- Loaded Namespaces
- Global Environment
 - e1_data data.frame: 184 obs. of 57 variables
 - E1data data.frame: 184 obs. of 42 variables
 - oa_data data.frame: 92 obs. of 57 variables
 - pp_data data.frame: 92 obs. of 57 variables
 - xy data.frame: 184 obs. of 3 variables
 - fit_oa Formal class 'lavaan' [package 'lavaan']...
 - fit_pp Formal class 'lavaan' [package 'lavaan']...
 - graph_oa List of 6
 - graph_pp List of 6
 - group Factor w/ 2 levels "OA","PP": 1 1 ...
 - grps List of 4
 - gs_learning num [1:184] 14.4 ...
 - gsLearning num [1:184] 14.4 ...
 - lbls chr [1:5] "General-\nskill\vnlearning" ...
 - max_v num 206
 - maxV num 206
 - min_v num -106
 - minV num -106
 - model_oa chr "ET_UNpp ~ ETPre + IQsum + ...
 - model_pp chr "ET_UNpp ~ ETPre + IQsum + ...
 - p1 List of 11
 - p2 List of 11
 - plot_results function(x, txt)
 - scatter List of 11
 - script_dir chr "/imaging/correia/da05/worksh..."
 - show function(fit)
 - ss_learning num [1:184] 28.6 ...
 - ssLearning num [1:184] 28.6 ...
 - xdens List of 11
 - xvar num [1:184] 14.4 ...

2024-03-VSCode > code > 04_RegressionResults_andFigure.R > ==

```
1 library(lavaan)
2 library(lavaan) # lavaan package: lavaan R Documentation
3
4 # Get the data
5 script_dir
6 # Set the working directory
7 setwd(script_dir)
8 # Import the data
9 e1_data
10 # Fit a latent variable model
11 # Fit a latent variable model.
12 # Usage:
13 # lavaan(model = NULL, data = NULL, ordered = NULL,
14 #         sampling.weights = NULL,
15 #         sample.cov = NULL, sample.mean = NULL, sample.th = NULL,
16 #         sample.nobs = NULL,
17 #         group = NULL, cluster = NULL, constraints = "",
18 #         WLS.V = NULL, NACOV = NULL, ov.order = "model",
19 #         e1_data$ETPre <- 1 - ((e1_data$ETPreUN + e1_data$ETPreUN) / 2)
20 # e1_data$ErrPre <- (e1_data$ErrPreTR + e1_data$ErrPreUN) / 2
21 # UN TR difference
22 e1_data$ITPreDiff <- e1_data$ITPreUN / e1_data$ITPreTR - 1
23 e1_data$ITPostDiff <- e1_data$ITPostUN / e1_data$ITPostTR - 1
24 e1_data$ETPreDiff <- e1_data$ETPreUN / e1_data$ETPreTR - 1
25 e1_data$ETPostDiff <- e1_data$ETPostUN / e1_data$ETPostTR - 1
26 e1_data$ErrPreDiff <- e1_data$ErrPreUN - e1_data$ErrPreTR
27 e1_data$ErrPostDiff <- e1_data$ErrPostUN - e1_data$ErrPostTR
28 # IT
29 e1_data$IT_TRpp <- (e1_data$ITPreTR / e1_data$ITPostTR - 1) * 100
30 e1_data$IT_UNpp <- (e1_data$ITPreUN / e1_data$ITPostUN - 1) * 100
31 # ET
32 e1_data$ET_TRpp <- (e1_data$ETPreTR / e1_data$ETPostTR - 1) * 100
33 e1_data$ET_UNpp <- (e1_data$ETPreUN / e1_data$ETPostUN - 1) * 100
34 # ER
35 e1_data$Err_TRpp <- e1_data$ErrPreTR - e1_data$ErrPostTR
36 e1_data$Err_UNpp <- e1_data$ErrPreUN - e1_data$ErrPostUN
37 # PostDiff-PreDiff
38 e1_data$ETppDiff <- e1_data$ETPostDiff - e1_data$ETPreDiff
39
40 e1_data$ETPost <- 1 - ((e1_data$ETPostTR + e1_data$ETPostUN) / 2)
```

TERMINAL

```
6 44 0 0 0 1
`geom_smooth()` using formula = 'y ~ x'
`geom_smooth()` using formula = 'y ~ x'
`geom_smooth()` using formula = 'y ~ x'
[1] "Done!"
> source("/imaging/correia/da05/workshops/2024-03-VSCode/code/03_Figure_TrainingEffects.R", encoding = "UTF-8")
> source("/imaging/correia/da05/workshops/2024-03-VSCode/code/04_RegressionResults_andFigure.R", encoding = "UTF-8")
This is lavaan 0.6-17
lavaan is FREE software! Please report any bugs.
>
```

SSH: login-j02

main

5 mins

Git Graph

R 4.3.2: 24560

Coding (bash) & Terminal

The screenshot displays the Visual Studio Code interface for a remote workspace. The Explorer sidebar on the left shows a project structure with folders like 'demo', 'FaceRecognition', 'code', and 'preprocessing'. The main editor window shows a bash script named 'step02_heudiconv_batch.sh' with the following content:

```
1 #!/bin/bash
2 # -----
3 # Dace Apšvalka (MRC CBU 2023)
4 # -----
5 set -eu
6
7 # Project path needs to be specified when submitting the function
8 # get the absolute path
9 PROJECT_PATH="$(cd "$(dirname "$1")" && pwd)"
10 #${1}
11
12 #-----
13 # Where the dicoms are located
14 #-----
15 DICOM_PATH="${PROJECT_PATH}/data/dicom/"
16
17 #-----
18 # Where to output jobs
19 #-----
20 JOB_DIR="${PROJECT_PATH}/data/work/bids/jobs"
21 mkdir -p "$JOB_DIR"
22 cd "$JOB_DIR"
23
24 #-----
25 # Get the list of subject for this project
26 #-----
27 # each subfolder in the dicom path
28 SUBJECT_LIST=()
29 for d in "$DICOM_PATH"*; do
30     sub_id=$(basename "$d")
31     SUBJECT_LIST+=("$sub_id")
32 done
33
```

The Terminal window at the bottom shows the execution of the script:

```
(fMRI) [da05@login-j02 FaceRecognition]$ conda activate fMRI
(fMRI) [da05@login-j02 FaceRecognition]$ ./code/preprocessing/step02_heudiconv_batch.sh
Submitted batch job 3414320
(fMRI) [da05@login-j02 FaceRecognition]$
```

On the right side, a Queue window displays the job submission details:

JOBID	PARTITION	NAME	USER	ST	TIME	NODES	NODELIST(REASON)
3414320_0	Main	step02_h	da05	R	0:02	1	node-h01
3414320_0	Main	step02_h	da05	CG	0:08	1	node-h01

The status bar at the bottom indicates the current file is 'step02_heudiconv_batch.sh', line 17, column 60, in Shell Script mode.

Jupyter Notebooks

The screenshot displays a Jupyter Notebook environment within Visual Studio Code. The interface includes a sidebar with Explorer, Outline, and Timeline views, and a main editor area with a code editor and a terminal.

Code Editor:

```
work_layout = BIDSLayout(work_dir, is_derivative=True, validate=False)

sID = '04'
```

Tissue segmentation and Surface reconstruction

```
orig = f"{work_dir}/sub-{{sID}}/func/sub-04_task-7TRep_run-01_desc-meandistortioncorrected_bold.nii"
wm = f"{work_dir}/sub-{{sID}}/func/sub-04_wm_bbr.nii.gz"

fig = plt.figure(figsize=(18, 5))
display = plotting.plot_anat(orig, display_mode="z", cut_coors=[0,-3,-15,-21], figure=fig, dim=-1)
display.add_contours(wm, colors='y')

#fig.savefig(f"{reports_dir}/WM-segmentation_sub-{{sID}}.png")
```

Terminal:

```
(fMRI) [da05@login-j02 preprocessing]$
```

Visualization:

The visualization shows four axial brain slices. The first two slices are labeled 'L' and 'R' at the top. The third and fourth slices are also labeled 'L' and 'R' at the top. Each slice displays a grayscale brain scan with yellow contours overlaid, representing the segmented tissue and surface reconstruction.

Terminal Output:

```
-bin/tcsh - preprocessing
```

Documenting (.md)

The image shows a Visual Studio Code editor window with a workspace named 'workshops (Workspace) [SSH: login-j02]'. The editor is open to a file named 'README.md' in the 'BIDS_conversion' directory. The file content is as follows:

```
1 # Converting CBU MRI DICOM data to BIDS format
3 ## Table of contents
16 - [Project-specific script with the "sbatch" command]
   (#project-specific-script-with-the-sbatch-command)
17 - [Checking your job status](#checking-your-job-status)
18 - [Validate the BIDS dataset](#validate-the-bids-dataset)
19 - [More use cases](#more-use-cases)
20 - [Multi-band acquisition with single-band reference scans ('sbref')]
   (#multi-band-acquisition-with-single-band-reference-scans-sbref)
21 - [Multi-echo data](#multi-echo-data)
22 - [Code examples](#code-examples)
23
24 ✨ Introduction
25 | You, 3 weeks ago • docs: full description as in wiki
26 To start working with your MRI data, you need to convert the raw `DICOM`
format data to `NIfTI` format and organise them according to the [BIDS
standard](https://bids-specification.readthedocs.io/en/stable/). This
tutorial outlines how to do that. If you have any questions, please email
[Dace Apšvalka](https://www.mrc-cbu.cam.ac.uk/people/dace.apsvalka/). The
example scripts described in this tutorial are available here in the [code]
(code) directory.
27
28 To perform the conversion on your CBU MRI data, you need to be logged into
CBU Compute Cluster.
29
30 ## The main steps
31
32 **1. Obtain the Scripts.**
33
34 Download the example scripts.
35
36 **2. Customize the Heuristic File.**
37
38 Modify the *bids_heuristic.py* file according to the specifics of your data
39
40 **3. Update the Python Script.**
41
42 Edit the *dicom_to_bids_multiple_subjects.py* script. You'll need to enter
your project details in the designated section at the top of the script.
This includes paths, subject IDs, and other relevant information.
43
44
```

The right-hand pane shows a preview of the README.md content, including a table of contents and an introduction section. The introduction section reads:

To start working with your MRI data, you need to convert the raw DICOM format data to NIfTI format and organise them according to the BIDS standard. This tutorial outlines how to do that. If you have any questions, please email Dace Apšvalka. The example scripts described in this tutorial are available here in the code directory.

To perform the conversion on your CBU MRI data, you need to be logged into CBU Compute Cluster.

The main steps

1. Obtain the Scripts.
2. Customize the Heuristic File.
3. Update the Python Script.
4. Execute the Script.

The terminal at the bottom shows the command prompt: [da05@login-j02 BIDS_conversion]\$

Reporting (LaTeX)

The image shows a LaTeX editor interface with three main panes. The left pane is the Explorer, showing a file tree with folders like 'papers' and files like '2024-FENS-abstract.tex'. The middle pane shows the source code of the LaTeX document, including package loading, page styling, and the beginning of the document structure. The right pane shows the rendered PDF output, which includes a title page with the title 'Cortical Layer-Specific Repetition Suppression to Faces in the Fusiform Face Area', authors 'Dace Apšvalka¹, Sung-Mu Lee², Marta Correia¹, Richard Henson¹', affiliations, keywords, and the main text starting with 'Repetition suppression (RS), the diminished neural response to repeated stimuli...'. The status bar at the bottom indicates the current file is '2024-FENS-abstract.tex', line 1, column 1, with a font size of 12pt and encoding of UTF-8.

```
1 % !TEX root = FENS-2024_abstract.tex
2
3 \documentclass[12pt, letterpaper]{article}
4 \usepackage[utf8]{inputenc}
5 \usepackage{times}
6 \usepackage[margin=1.3in]{geometry}
7 \usepackage{fancyhdr}
8
9 \tolerance=1000
10 \emergencystretch=3em
11
12
13 \pagestyle{empty} % This removes page numbers from
14
15 \pagestyle{fancy}
16 \fancyhf{} % clear all header and footer fields
17 \lhead{\scriptsize FENS 2024}
18
19 \begin{document}
20
21 \noindent\textbf{Cortical Layer-Specific Repetit
22
23 \vspace{0.5cm}
24
25 \noindent{Dace Apšvalka\(^{1}\)}, Sung-Mu Lee\(^{
26 \quad \quad \quad \small \(^{1}\)}University of Cambridge, MRC
```

FENS 2024

Cortical Layer-Specific Repetition Suppression to Faces in the Fusiform Face Area

Dace Apšvalka¹, Sung-Mu Lee², Marta Correia¹, Richard Henson¹

¹University of Cambridge, MRC Cognition and Brain Sciences Unit
²Purdue University

Keywords: laminar fMRI, repetition suppression, fusiform face area, predictive coding

Repetition suppression (RS), the diminished neural response to repeated stimuli, is a well-documented phenomenon potentially explained by predictive coding. This theory suggests that the brain anticipates incoming information, minimizing further processing for familiar stimuli. For example, fusiform face area (FFA) consistently shows decreased neural response to repeated presentation of the same faces. According to the traditional model of visual processing, information progresses from the lower brain regions' superficial cortical layers to the higher areas' middle layers. Within this framework, the FFA, as a higher processing region, is thought to show reduced prediction error in its middle layers with face repetition, leading to RS. To investigate this, we leveraged high-resolution laminar BOLD-fMRI. Overcoming the technical challenges of laminar BOLD-fMRI, we measured RS to faces across the FFA's cortical layers. Our preliminary findings show a pronounced RS effect predominantly in the middle cortical layers of the FFA, supporting predictive coding's role in efficient visual processing through top-down feedback. Further, we propose exploring RS effects in lower visual areas expecting greater RS effects in superficial and deep layers than in middle layers. Moreover, we hypothesise enhanced connectivity from FFA's superficial and deep layers to the early visual cortex's superficial layers, indicative of refined top-down predictions. Our preliminary results support the hypothesis that during the repetition of faces, there is a reduction in prediction error signals received by the middle layers of the FFA. We also showcase the potential of laminar BOLD-fMRI to elucidate the complexities of cortical processing.

February 23, 2024

Git integration and assistance

Visual Studio Code interface showing Git integration. The top bar indicates the workspace is 'workshops (Workspace) [SSH: login-j02]'. The left sidebar shows the Source Control view with a list of repositories under 'SOURCE CONTROL REPOSITORIES' and 'SOURCE CONTROL'. The main area displays the Git Graph view for the 'BIDS_conversion' repository, showing a commit history table with columns for Description, Date, Author, and Commit ID.

Description	Date	Author	Commit
Uncommitted Changes (1)	4 Mar 2024 01:28	*	*
style: quotes in variables	29 Feb 2024 18:11	Dace Apsvalka	d94b18cd
fix: misplaced text and wrong reference to subject_id	29 Feb 2024 18:07	Dace Apsvalka	364dfe8d
docs: updated MEG/README.md to reflect updates in the code	20 Feb 2024 14:27	Máté Aller	54f40cee
feat: moved event time adjustment details in config.py	20 Feb 2024 14:15	Máté Aller	492ba090
docs: updated conda environment paht in MEG/README.md	19 Feb 2024 11:39	Máté Aller	a695ea84
docs: added derivative analyses section to the Further steps in MEG/README.md	16 Feb 2024 17:08	Máté Aller	f55dc937
docs: updated documentation in meg_bids_data_conversion.process_subject()	16 Feb 2024 12:28	Máté Aller	7f724ee7
fix: fixed indexing bug in the loop around subjects in meg_bids_data_conversion.py	16 Feb 2024 12:08	Máté Aller	9ad0ffd0
docs: Updated documentation to reflect changes in command line input arguments and their default behaviour	15 Feb 2024 11:32	Máté Aller	7ee83810
fix!: Fixed issues regarding command line input arguments. This resulted that the default behaviour and the name of s...	15 Feb 2024 11:30	Máté Aller	2b470be6
fix: missing empty room recordings are handled without an error	14 Feb 2024 17:16	Máté Aller	97228438
docs: added further steps section and made various other improvements to MEG/README.md	14 Feb 2024 12:14	Máté Aller	dcb2977f
docs: toc sub-headers added	13 Feb 2024 21:22	Dace Apsvalka	30e0d054
docs: toc links	13 Feb 2024 21:09	Dace Apsvalka	ffa91b2f
docs: full description as in wiki	13 Feb 2024 21:07	Dace Apsvalka	ce480d8f
docs: CBU specific but adaptable	13 Feb 2024 18:09	Dace Apsvalka	80c77ac8
docs: Title change	13 Feb 2024 18:06	Dace Apsvalka	830a2650
docs: info on BIDS and tutorials	13 Feb 2024 18:04	Dace Apsvalka	820323c6
Merge branch 'main' of https://github.com/MRC-CBU/BIDS_conversion MEG BIDS	13 Feb 2024 17:52	Dace Apsvalka	a3c096f0
fix: updated MEG/README.md to fix some typos	13 Feb 2024 17:14	Máté Aller	85ca28b0
feat: added example subject_info.json	13 Feb 2024 17:06	Máté Aller	bb4fda0f
chore: removed meg_envirnoment.yml	13 Feb 2024 14:17	Máté Aller	c8313607
docs: updated documentation in meg_bids_data_conversion.py	13 Feb 2024 14:12	Máté Aller	2efe7281
docs: updated MEG/README.md with installation instructions	13 Feb 2024 14:11	Máté Aller	02a97df9
Merge pull request #1 from MRC-CBU/meg_conversion	13 Feb 2024 13:42	Máté Aller	c9dc014f
docs: updated README.md for MEG conversion	13 Feb 2024 12:21	Máté Aller	d9fedfbf
feat: renamed the --MEG_system argument to --meg_system and added new --delete_source argument to meg_bids_d...	13 Feb 2024 12:20	Máté Aller	932f8a09
feat: added environment file for meg bids conversion	9 Feb 2024 17:00	Máté Aller	1d977b01
feat: Added MEG data to BIDS conversion script and related files	9 Feb 2024 16:58	Máté Aller	252a2ca5
chore: updated .gitignore	9 Feb 2024 16:57	Máté Aller	7c62295f
work not in data	26 Jan 2024 20:45	Dace Apsvalka	f89cba36

Installing VS Code

- Advise for the CBU users:

✓ Install it yourself on your computer (green light from IT)

✗ not through the Software Portal!

? don't use it on the login nodes (except for special cases which we will show later)

- <https://code.visualstudio.com/>

The image shows a composite of two parts. On the left is the Visual Studio Code website landing page, featuring the slogan "Code editing. Redefined." and a download table. On the right is a screenshot of the Visual Studio Code IDE interface, showing the Extensions Marketplace, a code editor with JavaScript code, and a terminal window.

Code editing. Redefined.
Free. Built on open source. Runs everywhere.

		Download for Windows	
		Stable Build	
		Stable	Insiders
macOS	Universal	↓	↓
Windows x64	User Installer	↓	↓
Linux x64	.deb	↓	↓
	.rpm	↓	↓

Other downloads or open on web

EXTENSIONS: MARKETPLACE

- @sortinstalls
- Python 2019.6.24221 54.9M 4.5
- GitLens — Git super... 9.8.5 23.1M 5
- C/C++ 0.24.0 23M 3.5
- ESLint 1.9.0 21.9M 4.5
- Debugger for Ch... 4.11.6 20.6M 4
- Language Supp... 0.47.0 18.7M 4.5
- vscode-icons 8.8.0 17.2M 5
- Vetur 0.21.1 17M 4.5
- C# 1.21.0 15.6M 4

```
src > JS serviceWorker.js > register > window.addEventListener("load") callback
39 checkValidServiceWorker(swUrl, config);
40
41 // Add some additional logging to localhost, p
42 // service worker/PWA documentation,
43 navigator.serviceWorker.ready.then(() => {
44
45   product
46   productSub
47   removeSiteSpecificTrackingException
48   removeWebWideTrackingException
49   requestMediaKeySystemAccess
50   sendBeacon
51   serviceWorker (property) Navigator.serviceWorke...
52   storage
53   storeSiteSpecificTrackingException
54   storeWebWideTrackingException
55   userAgent
56   vendor
57 }
58
59 function registerValidSW(swUrl, config) {
60   navigator.serviceWorker
61     .register(swUrl)
62     .then(registration => {
```

TERMINAL ... 1: node

You can now view create-react-app in the browser.

Local: http://localhost:3000/
On Your Network: http://10.211.55.3:3000/

Note that the development build is not optimized.



IntelliSense



Run and Debug



Built-in Git



Extensions

File Edit Selection View ... Search

Welcome x

< Welcome

Get Started with VS Code

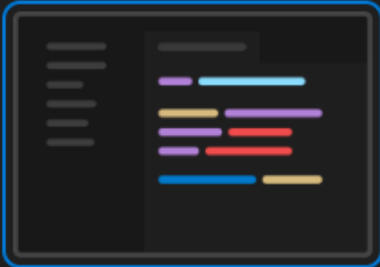
Customize your editor, learn the basics, and start coding

Choose your theme


The right theme helps you focus on your code, is easy on your eyes, and is simply more fun to use.

[Browse Color Themes](#)


Tip: Use keyboard shortcut(Ctrl+K Ctrl+T)




Dark Modern



Light Modern



Dark High Contrast



Light High Contrast

[See More Themes...](#)

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- Tune your settings
- Sync settings across devices
- Unlock productivity with the Command Pale.

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0 0 0

Live Demos

Keyboard shortcuts for Windows

<https://code.visualstudio.com/shortcuts/keyboard-shortcuts-windows.pdf>



Visual Studio Code

Keyboard shortcuts for Windows

General

Ctrl+Shift+P, F1	Show Command Palette
Ctrl+P	Quick Open, Go to File...
Ctrl+Shift+N	New window/instance
Ctrl+Shift+W	Close window/instance
Ctrl+,	User Settings
Ctrl+K Ctrl+S	Keyboard Shortcuts

Basic editing

Ctrl+X	Cut line (empty selection)
Ctrl+C	Copy line (empty selection)
Alt+ ↑ / ↓	Move line up/down
Shift+Alt + ↑ / ↓	Copy line up/down
Ctrl+Shift+K	Delete line
Ctrl+Enter	Insert line below
Ctrl+Shift+Enter	Insert line above
Ctrl+Shift+\	Jump to matching bracket
Ctrl+] / [Indent/outdent line
Home / End	Go to beginning/end of line
Ctrl+Home	Go to beginning of file
Ctrl+End	Go to end of file
Ctrl+↑ / ↓	Scroll line up/down
Alt+PgUp / PgDn	Scroll page up/down
Ctrl+Shift+[Fold (collapse) region
Ctrl+Shift+]	Unfold (uncollapse) region
Ctrl+K Ctrl+[Fold (collapse) all subregions
Ctrl+K Ctrl+]	Unfold (uncollapse) all subregions

Ctrl+M Toggle Tab moves focus

Search and replace

Ctrl+F	Find
Ctrl+H	Replace
F3 / Shift+F3	Find next/previous
Alt+Enter	Select all occurrences of Find match
Ctrl+D	Add selection to next Find match
Ctrl+K Ctrl+D	Move last selection to next Find match
Alt+C / R / W	Toggle case-sensitive / regex / whole word

Multi-cursor and selection

Alt+Click	Insert cursor
Ctrl+Alt+ ↑ / ↓	Insert cursor above / below
Ctrl+U	Undo last cursor operation
Shift+Alt+I	Insert cursor at end of each line selected
Ctrl+L	Select current line
Ctrl+Shift+L	Select all occurrences of current selection
Ctrl+F2	Select all occurrences of current word
Shift+Alt+→	Expand selection
Shift+Alt+←	Shrink selection
Shift+Alt + (drag mouse)	Column (box) selection
Ctrl+Shift+Alt + (arrow key)	Column (box) selection
Ctrl+Shift+Alt +PgUp/PgDn	Column (box) selection page up/down

Rich languages editing

Ctrl+Space, Ctrl+I	Trigger suggestion
Ctrl+Shift+Space	Trigger parameter hints
Shift+Alt+F	Format document

File management

Ctrl+N	New File
Ctrl+O	Open File...
Ctrl+S	Save
Ctrl+Shift+S	Save As...
Ctrl+K S	Save All
Ctrl+F4	Close
Ctrl+K Ctrl+W	Close All
Ctrl+Shift+T	Reopen closed editor
Ctrl+K Enter	Keep preview mode editor open
Ctrl+Tab	Open next
Ctrl+Shift+Tab	Open previous
Ctrl+K P	Copy path of active file
Ctrl+K R	Reveal active file in Explorer
Ctrl+K O	Show active file in new window/instance

Display

F11	Toggle full screen
Shift+Alt+0	Toggle editor layout (horizontal/vertical)
Ctrl+ = / -	Zoom in/out
Ctrl+B	Toggle Sidebar visibility
Ctrl+Shift+E	Show Explorer / Toggle focus
Ctrl+Shift+F	Show Search
Ctrl+Shift+G	Show Source Control
Ctrl+Shift+D	Show Debug
Ctrl+Shift+X	Show Extensions
Ctrl+Shift+H	Replace in files
Ctrl+Shift+J	Toggle Search details
Ctrl+Shift+U	Show Output panel
Ctrl+Shift+V	Open Markdown preview
Ctrl+K V	Open Markdown preview to the side
Ctrl+K Z	Zen Mode (Esc Esc to exit)

Debug

Resources

- Official Documentation: <https://code.visualstudio.com/docs/>
- Twitter account: <https://twitter.com/code>

- [Remote development using SSH](#)
- [Python development](#)
 - [Python environments](#)
 - [Debugging](#)
 - [Interactive Python](#)
 - [Python interactive window](#)
 - [Jupyter notebooks](#)
- [Markdown](#)
- [JSON](#)

Resources

- Online tutorials, e.g.:
 - <https://www.youtube.com/watch?v=heXQnM99oAI> (6h, but divided in chapters)

