

Swift for TensorFlow

可以拋棄 Python 了？

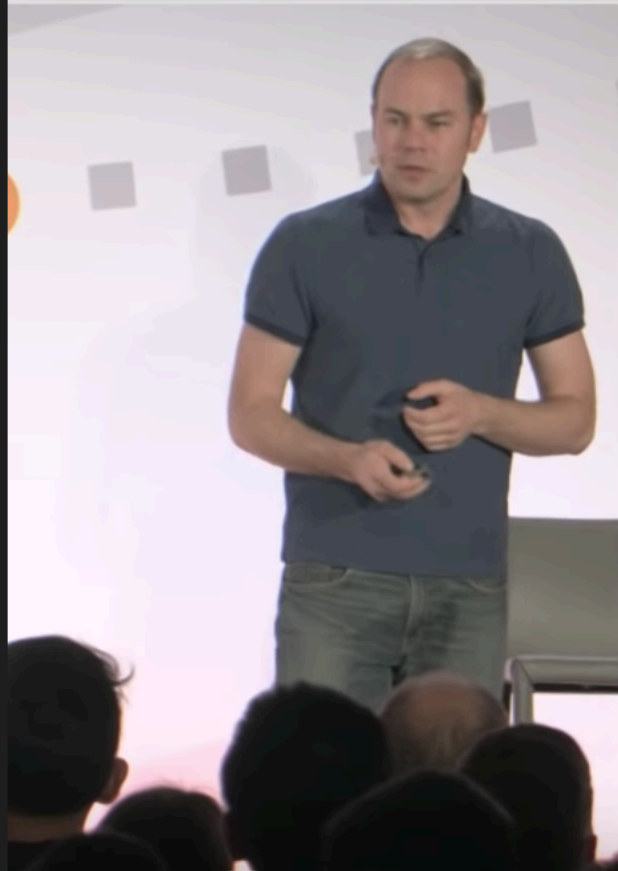
Google 開源 Swift for TensorFlow 意味著什麼？

“在此背景之下，可以看到兩種趨勢正慢慢滲透：**一個是通過神經網路和深度學習掀起的人工智慧復興；一個是向數十億智慧手機和物聯網裝置上執行的移動為先應用的轉變。**這兩種技術都需要高效能運算能力，這種情況下Python就顯得尤為不適了。

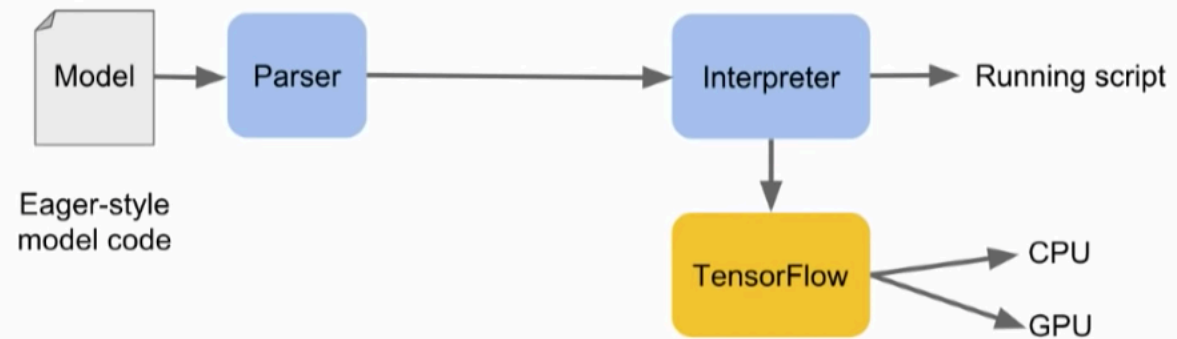
一方面，深度學習在算力上非常昂貴，需要通過張量運算的長鏈傳遞巨大的資料集。為了快速執行這些計算，軟體必須將數以千計的線條和核心與專用處理器進行編譯。在移動裝置的功耗和熱量被得以真正關注的情況下，這些問題開始加劇了。**相對來講，以更少的記憶體換來更為高效的處理器以優化應用，這都是一個不小的挑戰。**顯然，迄今為止，Python依然不再是一個很好的解決方案。

而對資料科學家和機器學習研究人員來講，這就是很大的問題。因為，我們不再訴諸於讓GPU承受大量工作負載，但多數人又深陷移動應用開發的泥潭，再耗費時間學習一門新的程式語言似乎不太現實，但這種轉換成本實在太高了。例如Node.js這樣的JavaScript專案和React Native這樣的跨平臺抽象工具。現在，我很難在Python的環境下完成專案。

在由機器學習和邊緣計算主導的世界中，Python無法成為端到端語言，主要還是因為Swift for TensorFlow的推動。**Chris Lattner認為，Python作為一種動態型語言，無法帶領我們走得更遠。**用他的話來講，工程師需要一種把機器學習當做‘一等公民’的程式語言。當然，雖然他深刻闡述了為什麼採用新的編譯分析與改變利用TensorFlow搭建專案的方式息息相關，但是他最為引人矚目的還對程式設計過程的理解。”



Eager Execution



and that's what we're doing.



2:04 / 14:04





Swift for TensorFlow

Swift for TensorFlow: No boundaries.

Swift for TensorFlow is a next-generation platform for machine learning, incorporating the latest research across machine learning, compilers, differentiable programming, systems design, and beyond. This is an early-stage project: it is not feature-complete nor production-ready, but it is ready for *pioneers* to try in projects, give feedback, and help shape the future!

The Swift for TensorFlow project is currently focusing on 2 kinds of users:

1. **Advanced ML researchers** who are limited by current ML frameworks. Swift for TensorFlow's advantages include seamless integration with a modern general-purpose language, allowing for more dynamic and sophisticated models. Fast abstractions can be developed in "user-space" (as opposed to in C/C++, aka "framework-space"), resulting in modular APIs that can be easily customized.

首先到[Swift for TensorFlow在GitHub的網址](#) 點擊紅框圈選之處

Getting started

Using Swift for TensorFlow

- **Google Colaboratory:** The fastest way to get started is to try out Swift for TensorFlow right in your browser. Just open up [a tutorial](#), or start from a [blank notebook](#)! Read more in our [usage guide](#).
- **Install locally:** you can [download a pre-built Swift for TensorFlow package](#). After installation, you can follow these [step-by-step instructions](#) to build and execute a Swift script on your computer.
- **Compile from source:** If you'd like to customize Swift for TensorFlow or contribute back, follow our [instructions](#) on building Swift for TensorFlow from source.

下載Package

Releases

[Release notes for v0.6.0](#)

Download	Version	Date
Xcode 11	v0.6.0	Dec 10, 2019
Ubuntu 18.04 (CPU Only)	v0.6.0	Dec 10, 2019
Ubuntu 18.04 (CUDA 10.1)	v0.6.0	Dec 10, 2019
Ubuntu 18.04 (CUDA 10.0)	v0.6.0	Dec 10, 2019
Ubuntu 18.04 (CUDA 9.2)	v0.6.0	Dec 10, 2019

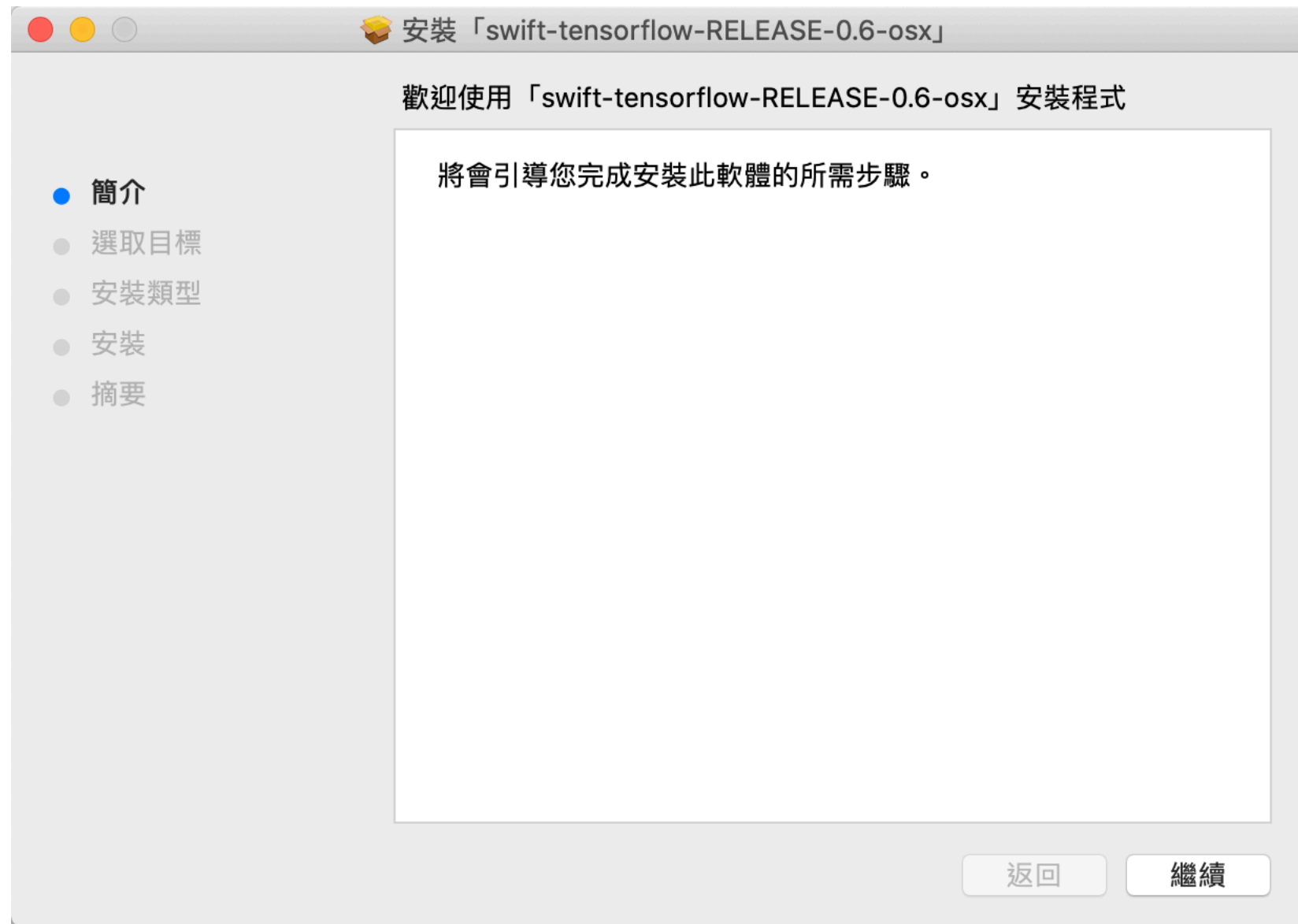
當試圖打開下載好的package時會跳出警告



這時點擊右上角的  打開系統偏好設定->安全性與隱私權->一般，點擊**強制打開**



再次點擊下載好的package，依步驟進行安裝



打開Xcode，點擊左上方Xcode->Preferences

The screenshot shows the Xcode application interface. The top menu bar includes 'Xcode', 'File', 'Edit', 'View', 'Find', 'Navigate', 'Editor', 'Product', 'Debug', 'Source Control', 'Window', and 'Help'. The 'Xcode' menu is open, with 'Preferences...' highlighted. The main workspace displays the 'Welcome to Xcode' screen for Version 11.2.1 (11B500) with the Swift for TensorFlow 0.6 Release Toolchain. The screen features a hammer icon and three main options: 'Get started with a playground', 'Create a new Xcode project', and 'Clone an existing project'. The right sidebar shows a list of projects, including 'TensorFlowModels', 'STSPProject', 'swift-tensorflow-starter-1.0.0', 'oscar', 'swift-master', and 'MyPlayground'. The left sidebar shows a folder named 'make paper' and a folder named '獎學金'.

Xcode File Edit View Find Navigate Editor Product Debug Source Control Window Help

About Xcode
Xcode Extensions...
Preferences... ⌘,
Behaviors ▶
Toolchains ▶
Xcode Server...
Open Developer Tool Services ▶
Hide Xcode ⌘H
Hide Others ⌘⇧H
Show All
Quit Xcode ⌘Q

Welcome to Xcode
Version 11.2.1 (11B500)
Swift for TensorFlow 0.6 Release Toolchain

- Get started with a playground**
Explore new ideas quickly and easily.
- Create a new Xcode project**
Create an app for iPhone, iPad, Mac, Apple Watch, or Apple TV.
- Clone an existing project**
Start working on something from a Git repository.

TensorFlowModels
~/Desktop/swift-models

STSPProject
~/Desktop/swift-tensorflow-starter-1.0.0

swift-tensorflow-starter-1.0.0
~/Desktop

oscar
~/Desktop

swift-master
~/Downloads

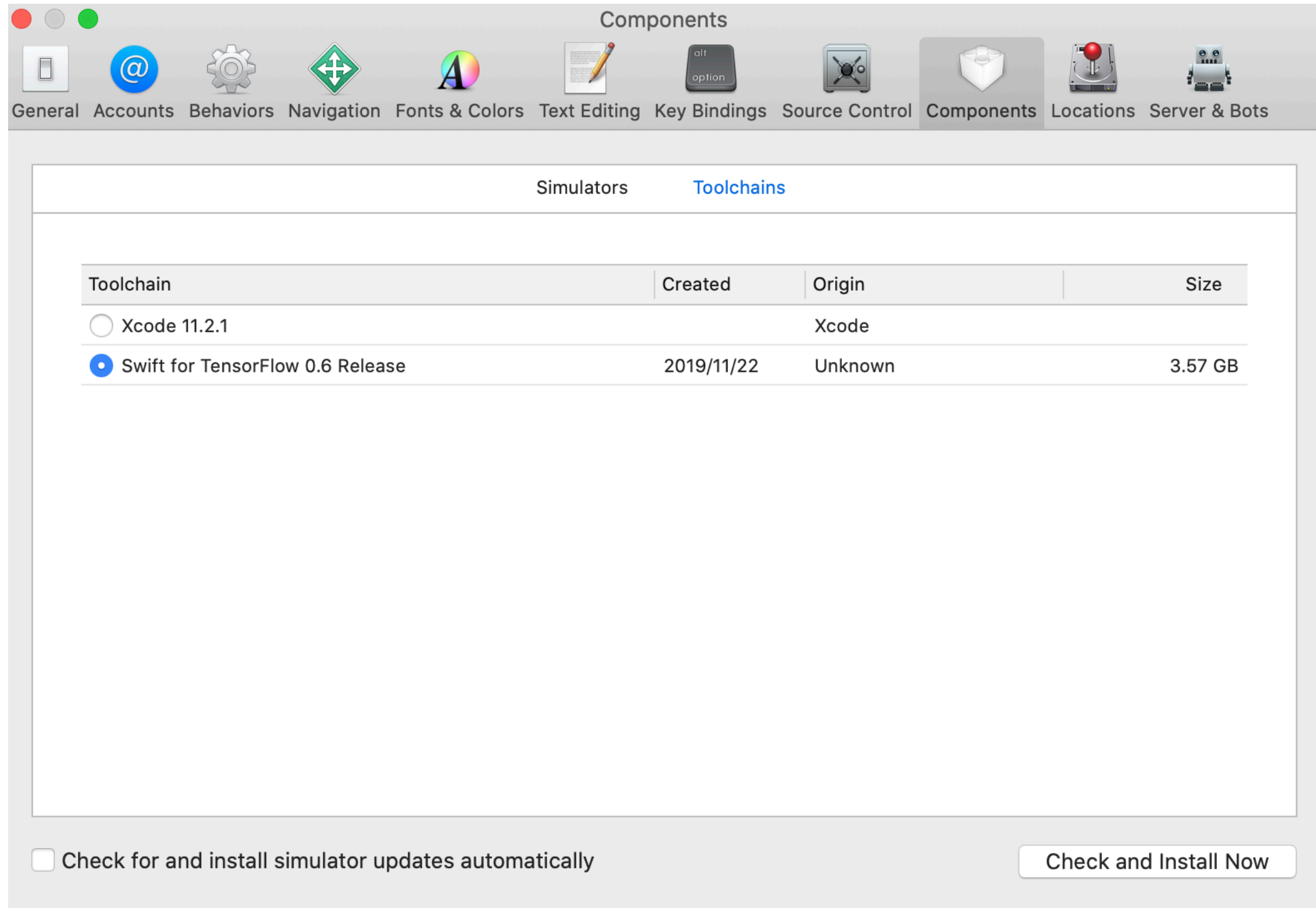
MyPlayground
~/Desktop

Open another project...

make paper

獎學金

在Components下選擇 Swift for TensorFlow 0.6 Release



加入路徑

6. Selecting a Swift toolchain affects the Xcode IDE only. To use the Swift toolchain with command-line tools, use `xcrun --toolchain swift` and `xcodebuild -toolchain swift`, or add the Swift toolchain to your path as follows:

```
export PATH=/Library/Developer/Toolchains/swift-latest/usr/bin:"${PATH}"
```

官方步驟

1. Download the latest package release.
2. Run the package installer, which will install an Xcode toolchain into `/Library/Developer/Toolchains/`.
3. An Xcode toolchain (`.xctoolchain`) includes a copy of the compiler, lldb, and other related tools needed to provide a cohesive development experience for working in a specific version of Swift.
4. Open Xcode's `Preferences` , navigate to `Components > Toolchains` , and select the installed Swift for TensorFlow toolchain.
5. Xcode uses the selected toolchain for building Swift code, debugging, and even code completion and syntax coloring. You'll see a new toolchain indicator in Xcode's toolbar when Xcode is using a Swift toolchain. Select the Xcode toolchain to go back to Xcode's built-in tools. **Note:** in Xcode 10, you may also have to switch to the legacy build system. In Xcode go to `File > Project Settings` and set the build system to `Legacy Build System` .
6. Selecting a Swift toolchain affects the Xcode IDE only. To use the Swift toolchain with command-line tools, use `xcrun --toolchain swift` and `xcodebuild -toolchain swift` , or add the Swift toolchain to your path as follows:

```
$ export PATH=/Library/Developer/Toolchains/swift-latest/usr/bin:"${PATH}"
```

7. **CUDA-only:** If you downloaded a CUDA GPU-enabled toolchain, add the library path(s) for CUDA and cuDNN to `$LD_LIBRARY_PATH` :

```
$ export LD_LIBRARY_PATH=/usr/local/cuda/lib:"${LD_LIBRARY_PATH}"
```


下載範例

tensorflow / swift-models

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Code

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Models and examples built with Swift for TensorFlow

214 commits

20 branches

0 packages

0 releases

32 contributors

Apache-2.0

Branch: master

New pull request

Find file

Clone or download

BradLarson Adding comments as hooks for Python support when imported internally. (...)

Latest commit 82d1e0c 23 hours ago

Autoencoder tweak gradient calls to match api change (#235)

21 days ago

Benchmarks Minor changes to average/standard deviation calculation. (#266)

3 days ago

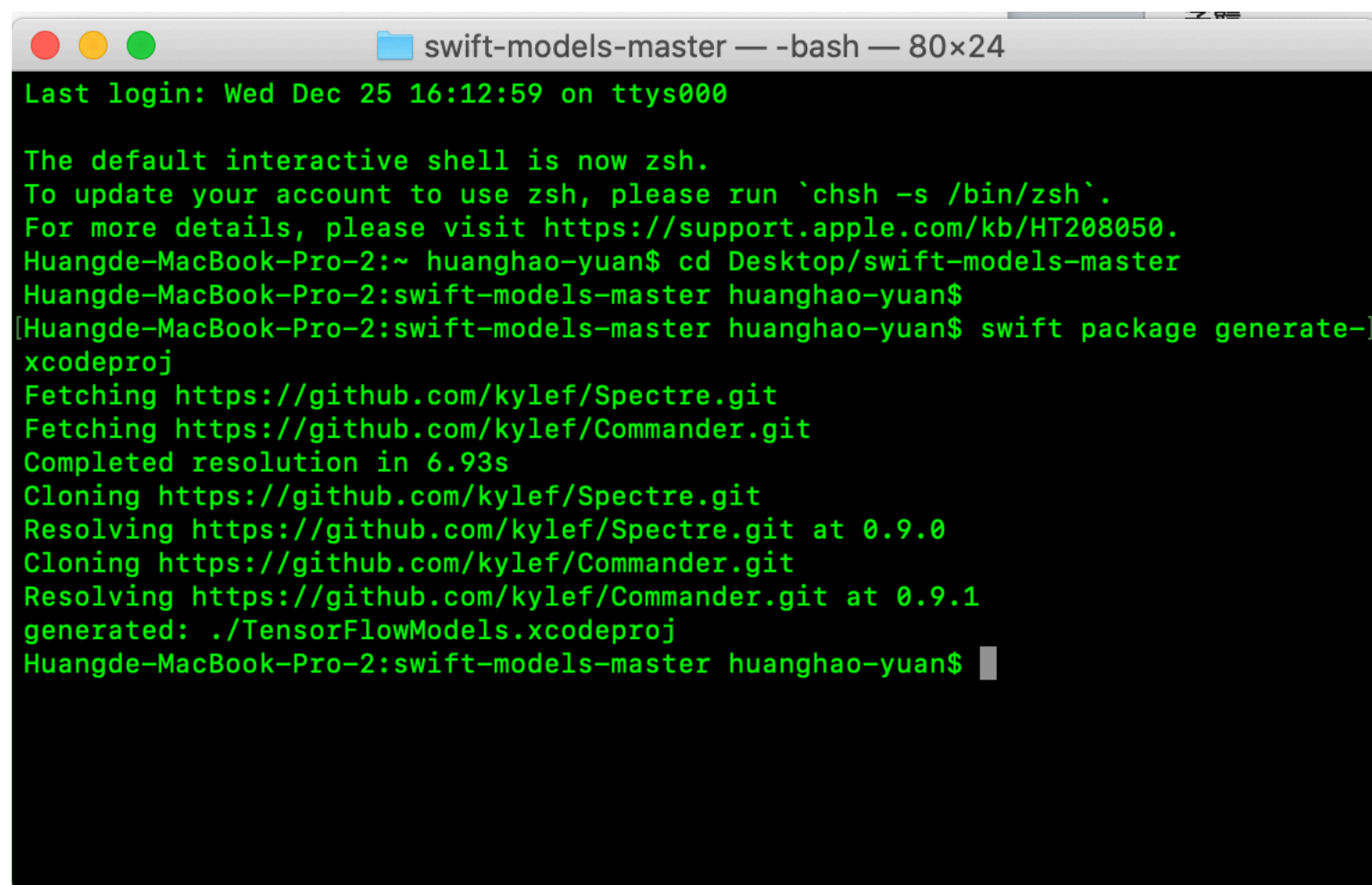
Swift Package Manager

將下載好的檔案解壓縮後放到桌面，打開終端機輸入以下指令

```
cd Desktop/swift-models-master
```

```
swift package generate-xcodeproj
```

成功結果如下

A terminal window titled 'swift-models-master' with a window size of '80x24'. The terminal shows the following output:

```
Last login: Wed Dec 25 16:12:59 on ttys000

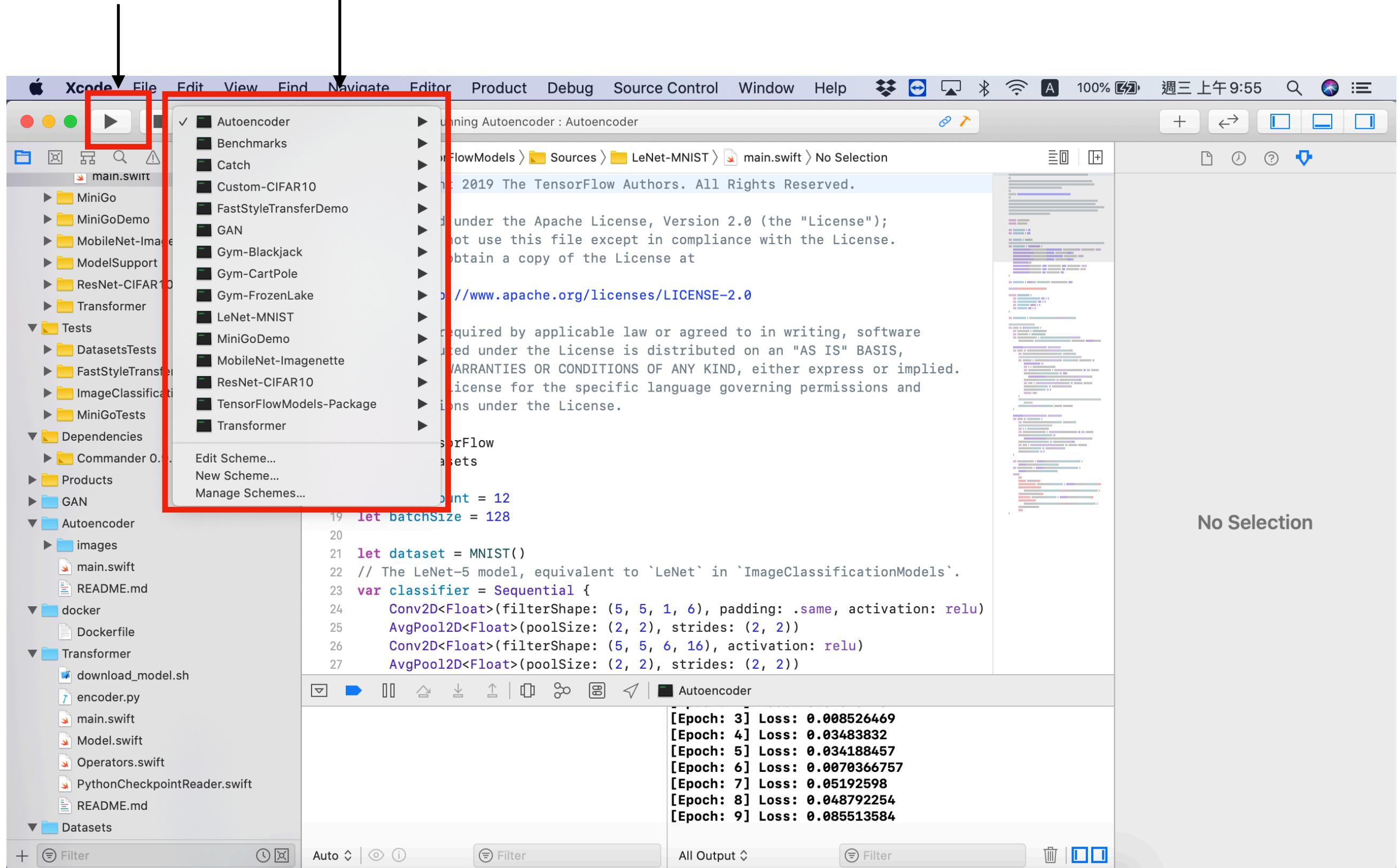
The default interactive shell is now zsh.
To update your account to use zsh, please run `chsh -s /bin/zsh`.
For more details, please visit https://support.apple.com/kb/HT208050.
Huangde-MacBook-Pro-2:~ huanghao-yuan$ cd Desktop/swift-models-master
Huangde-MacBook-Pro-2:swift-models-master huanghao-yuan$
[Huangde-MacBook-Pro-2:swift-models-master huanghao-yuan$ swift package generate-
xcodeproj
Fetching https://github.com/kylef/Spectre.git
Fetching https://github.com/kylef/Commander.git
Completed resolution in 6.93s
Cloning https://github.com/kylef/Spectre.git
Resolving https://github.com/kylef/Spectre.git at 0.9.0
Cloning https://github.com/kylef/Commander.git
Resolving https://github.com/kylef/Commander.git at 0.9.1
generated: ./TensorFlowModels.xcodeproj
Huangde-MacBook-Pro-2:swift-models-master huanghao-yuan$
```

打開資料夾，點擊TensorFlowModels.xcodeproj

名稱	大小	種類	加入日期
▼ swift-models-masterabc	--	檔案夾	今天 上午 9:41
TensorFlowModels.xcodeproj	234 KB	Xcode Project	今天 上午 9:51
▶ .build	--	檔案夾	今天 上午 9:50
▶ docker	--	檔案夾	今天 上午 9:41
▶ Transformer	--	檔案夾	今天 上午 9:41
▶ Tests	--	檔案夾	今天 上午 9:41
▶ Support	--	檔案夾	今天 上午 9:41
README.md	2 KB	Markdo...ument	今天 上午 9:41
Package.swift	4 KB	Swift Source	今天 上午 9:41
Package.resolved	585 byte	文件	今天 上午 9:41
▶ Models	--	檔案夾	今天 上午 9:41
▶ MiniGo	--	檔案夾	今天 上午 9:41
LICENSE	12 KB	文字編輯文件	今天 上午 9:41
▶ Gym	--	檔案夾	今天 上午 9:41
▶ GAN	--	檔案夾	今天 上午 9:41
▶ FastStyleTransfer	--	檔案夾	今天 上午 9:41
▶ Examples	--	檔案夾	今天 上午 9:41
▶ Datasets	--	檔案夾	今天 上午 9:41
▶ Catch	--	檔案夾	今天 上午 9:41
CONTRIBUTING.md	2 KB	Markdo...ument	今天 上午 9:41
CODE_OF_CONDUCT.md	5 KB	Markdo...ument	今天 上午 9:41
▶ Benchmarks	--	檔案夾	今天 上午 9:41
▶ Autoencoder	--	檔案夾	今天 上午 9:41
.swift-format	334 byte	文字編輯文件	今天 上午 9:41
.gitignore	274 byte	文字編輯文件	今天 上午 9:41

按run就能使用囉

此處可選擇想進行的範例



練習

利用TensorFlow在Swift上運行範例中的其中任何一個模型。

參考資源

官網

GitHub上的資源

範例

Swift Package Manager