

Raspberry Pi Image Customization with GitHub Actions



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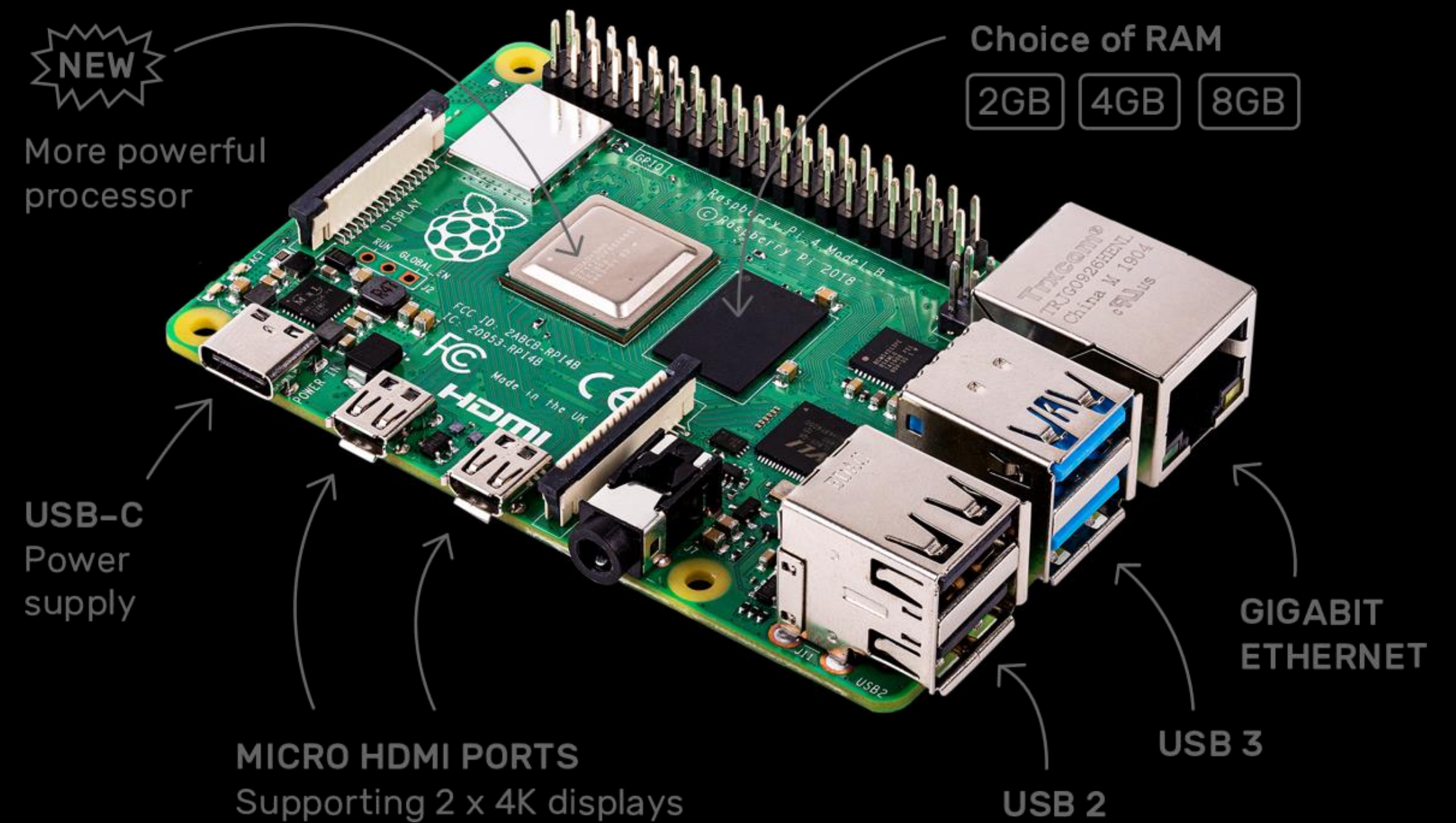
Passionate code monkey 🐵 Geek 🏠 Gamer 🎮 Hobby baker 🧑‍🍳
Creator & maintainer of OctoPrint 🐙 GitHub Star ⭐

Introduction & Motivation

Raspberry Pi? Images? Customization? Why?

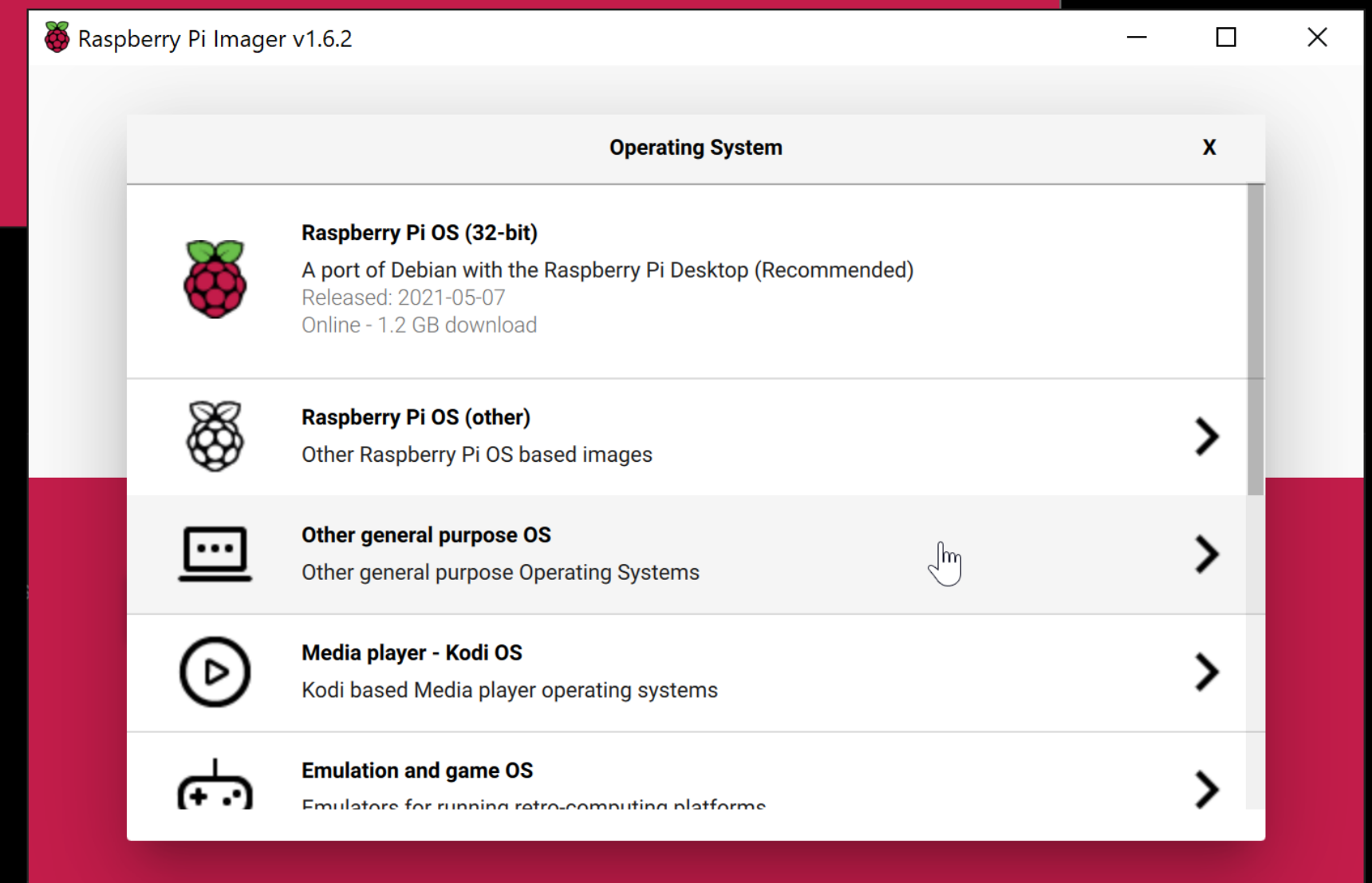
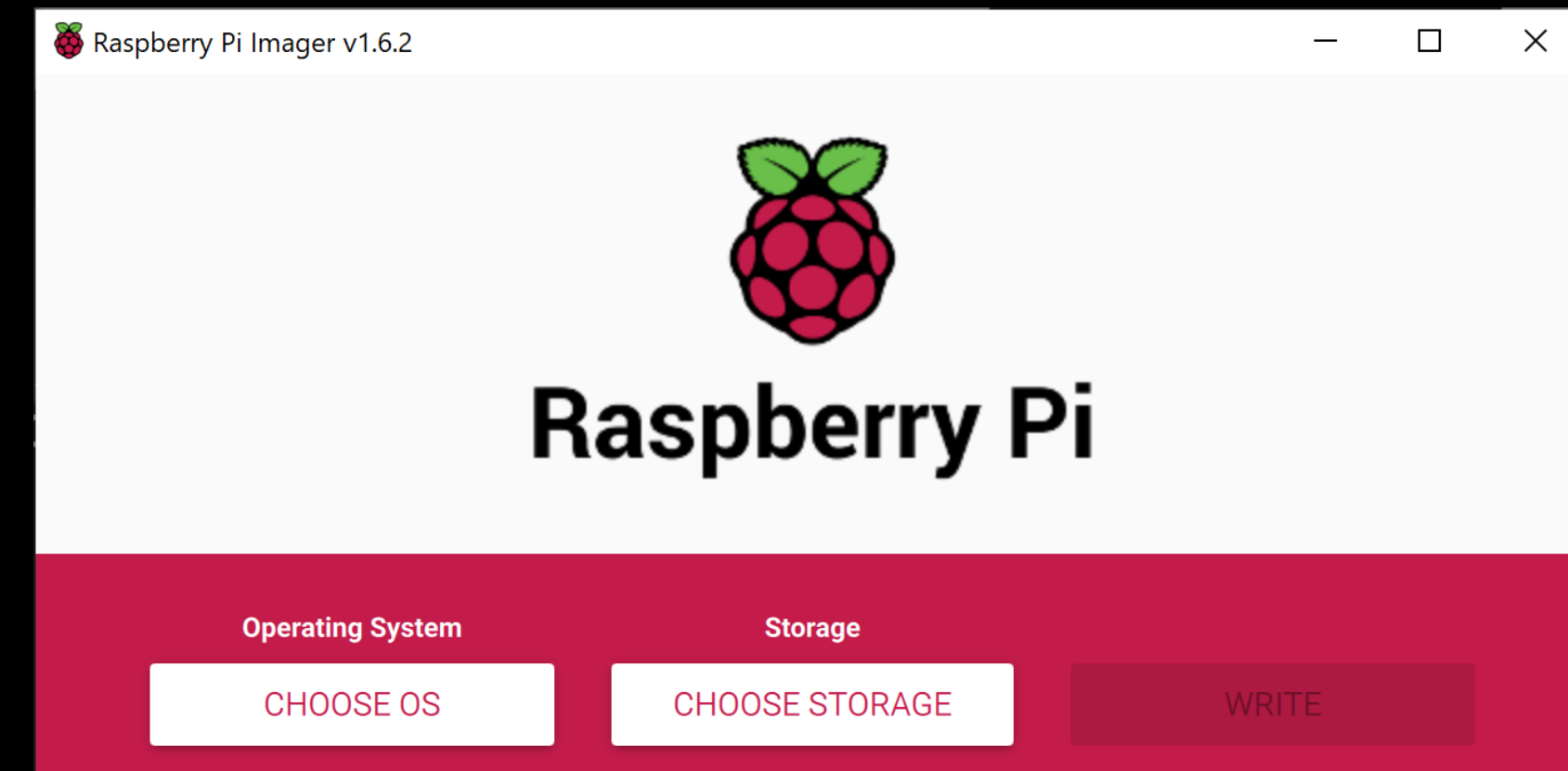
Raspberry Pi?

- Small Single Board Computer
- Released in 2012
- Starts at 35 bucks
- Boots from an SD card flashed with an OS image



Flashed OS image?

- Most often: “Raspberry Pi OS”, Debian derivative
- One .iso file
- Two partitions: /boot (FAT32) & / (ext4)
- Flashed via a flash tool like the **Raspberry Pi Imager**



OS choice: rpi-imager.json



```
● ● ●  
  
{  
  "os_list": [  
    {  
      "name": "OctoPi (stable)",  
      "description": "OctoPi 0.18.0 with OctoPrint 1.6.1",  
      "url": "https://github.com/OctoPrint/OctoPi-UpToDate/releases/.../octopi-0.18.0-1.6.1.img.zip",  
      "icon": "https://octopi.octoprint.org/rpi-imager.png",  
      "release_date": "2021-06-30",  
      "extract_size": 2489319424,  
      "extract_sha256": "36B8536557901200F16ADE3A59655EE389B93465944E1C9589642277B518A90F",  
      "image_download_size": 757551423,  
      "image_download_sha256": "27ECCF9C0B27CD2DAF86094CBBEBDF1A9F23E62587D45C701219BF140F2A72E4"  
    },  
    // ...  
  ]  
}
```

Why customize an image?

- To preinstall or **update** software
- To preconfigure things
- Case in Point: OctoPi
 - OctoPrint + ... + preconfig
 - Keep OctoPrint updated!



Why not do it interactively?

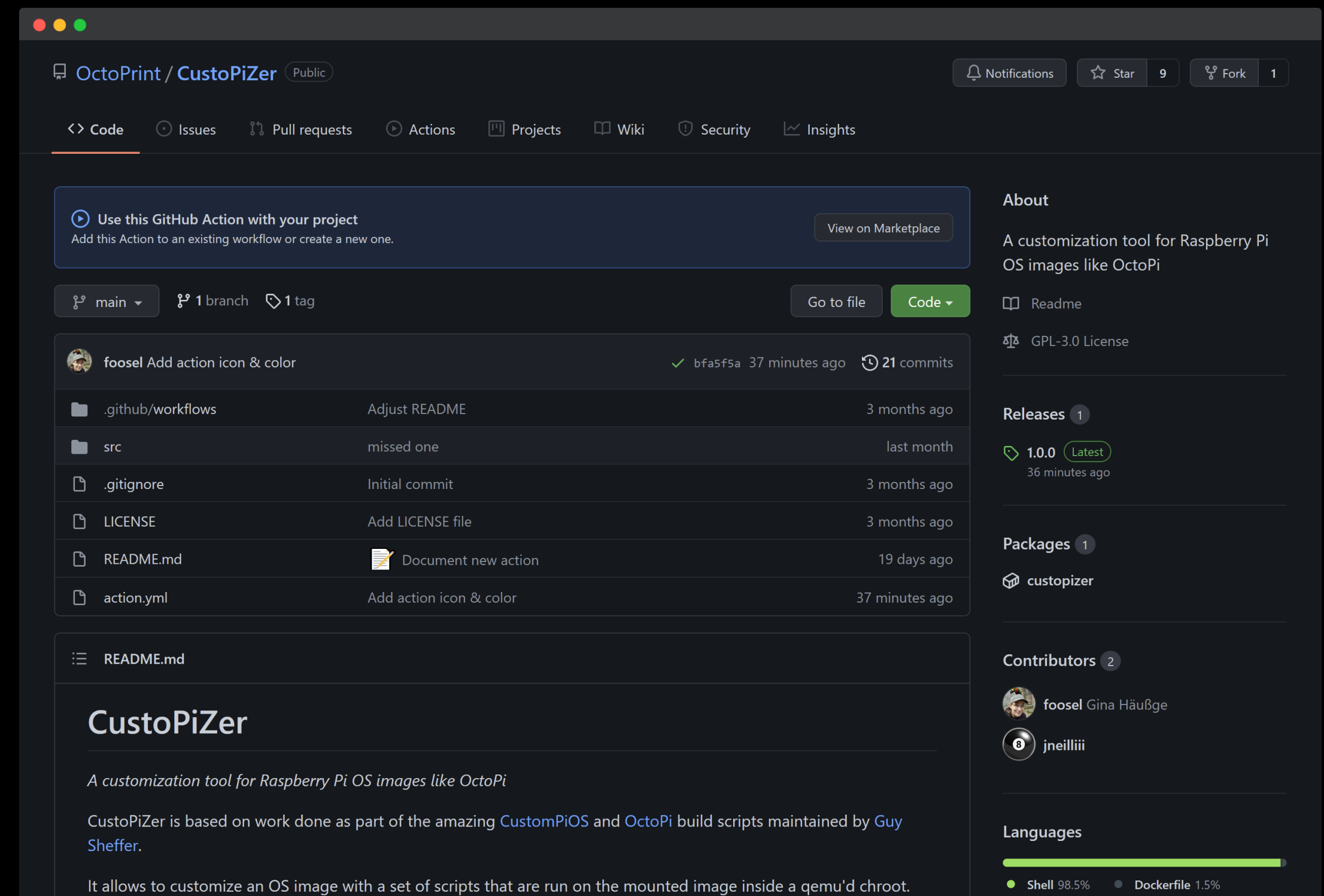
- Many things happen on first boot
 - Key generation
 - File system extension
 - More, depending on software
- Consequence: Boot & copy = 
- Also: Automating builds = 

Enter: CustoPiZer

 [OctoPrint/CustoPiZer](#)

CustoPiZer

- Customization tool for images
 - Mounts partitions
 - Runs scripts inside chroot
- Available as Docker image!
- Available as GitHub Action!
- based on work by Guy Sheffer



Usage as GitHub Action



```
- name: Run CustopiZer
  uses: OctoPrint/CustopiZer@main
  with:
    workspace: "${{ github.workspace }}/build"
    scripts: "${{ github.workspace }}/scripts"
    environment: '{ "SOME_VAR": "SOME_VALUE" }'
```

Tying everything together

 [OctoPrint/OctoPi-UpToDate](#)

scripts/01-update-octoprint



```
set -x
```

```
set -e
```

```
export LC_ALL=C
```

```
source /common.sh
```

```
install_cleanup_trap
```

```
if [ -n "$OCTOPRINT_VERSION" ]; then
```

```
    sudo -u pi /home/pi/oprint/bin/pip install -U OctoPrint==$OCTOPRINT_VERSION
```

```
else
```

```
    sudo -u pi /home/pi/oprint/bin/pip install -U OctoPrint
```

```
fi
```

octoprint_release CustopiZe #12

[Sign in to view logs](#)[Summary](#)

Jobs

Build

Build



succeeded 16 days ago in 5m 46s

- ✓ Set up job 5s
- ✓ ↓ Checkout 1s
- ✓ 🔍 Determine OctoPi version 0s
- ✓ 🔍 Determine OctoPrint version 0s
- ✓ ↓ Download OctoPi 32s
- ✓ 🏠 Run CustopiZer 2m 21s
- ✓ ✏️ Rename image 0s
- ✓ 📄 Prepare release 0s
- ✓ 📦 Package the image 2m 28s
- ✓ NEW Generate rpi-imager.json snippet 0s
- ✓ 📄 Create release & attach assets 19s
- ✓ Post ↓ Checkout 0s
- ✓ Complete job 0s


rpi-imager.json snippet



```
- name: " NEW Generate rpi-imager.json snippet"
  uses: OctoPrint/actions/rpi-imager-snippet@main
  with:
    name: "${{ env.RELEASE_NAME }}"
    description: "A Raspberry Pi distribution for 3d printers. Ships
OctoPrint ${{ env.OCTOPRINT_VERSION }} out-of-the-box."
    icon: "https://octopi.octoprint.org/rpi-imager.png"
    url: "https://github.com/OctoPrint/OctoPi-UpToDate/releases/download/${{
env.RELEASE_TAG }}/${{ steps.package-image.outputs.zip_name }}"
    output: "build/rpi-imager.json"
    image_sha256: ${{ steps.package-image.outputs.image_sha256 }}
    image_size: ${{ steps.package-image.outputs.image_size }}
    zip_sha256: ${{ steps.package-image.outputs.zip_sha256 }}
    zip_size: ${{ steps.package-image.outputs.zip_size }}
```







[Releases](#)[Tags](#)Pre-release 0.18.0.op1.7.0rc3 5b340b1[Compare](#)


OctoPi 0.18.0 with OctoPrint 1.7.0rc3

 github-actions released this 16 days ago

Created with CustopiZer

Assets 6

 octopi-0.18.0-1.7.0rc3.zip	741 MB
 octopi-0.18.0-1.7.0rc3.zip.md5	61 Bytes
 octopi-0.18.0-1.7.0rc3.zip.sha256	93 Bytes
 rpi-imager.json	533 Bytes
 Source code (zip)	
 Source code (tar.gz)	

Pre-release 0.18.0.op1.7.0rc2

OctoPi 0.18.0 with OctoPrint 1.7.0rc2

And rpi-imager.json?



```
- name: 🛠️ Build rpi-imager.json
  uses: OctoPrint/actions/rpi-imager-json@main
  with:
    token: "${{ secrets.GITHUB_TOKEN }}"
    owner: OctoPrint
    repo: OctoPi-UpToDate
    output: ./files/rpi-imager.json
    nameStable: "OctoPi (stable)"
    namePrerelease: "OctoPi (prerelease)"
```

Summary

- Image customization as a ~5min GitHub Action run
- Automatic release generation
- Automatic rpi-imager.json snippet generation
- Merging of snippets for stable & pre releases and serving via GitHub pages
- ... and all fully automated! 🤖

**Thank you for your
attention!**

Slides: octoprint.org/slides/universe2021.pdf