

The background features a series of concentric, light gray circles centered on the page. Overlaid on these are black, stylized circuit traces. These traces are most prominent on the left and right edges, where they form a dense, branching pattern resembling a microchip layout. Some traces end in small open circles. The overall aesthetic is clean, modern, and tech-oriented.

VELKÉ NESNÁZE S MALÝM PROJEKTEM

DALIBOR HULA

WEPLER GROUP

• Nástrojárna • Vstřikování plastů • 100% kontrola



Skupina Wepler Group sídlící v Ostravě - Mariánských Horách působí v České republice již od roku 1994 a má více než 1000 zaměstnanců.



Wepler Czech

Primárně se zabýváme lisováním plastových a kovových dílů pro automobilový průmysl



Wepler Tools

Zabýváme se především výrobou střížných a tvarovacích nástrojů, přesných strojních dílů a vstřikovacích forem



Wepler & Trefil

Naše společnost se dlouhodobě zabývá 100% kontrolou mikro-filtračních komponentů



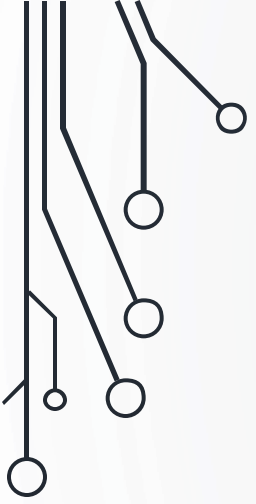
**Dodáváme do 250
závodů světa**

<https://wepplergroup.cz>

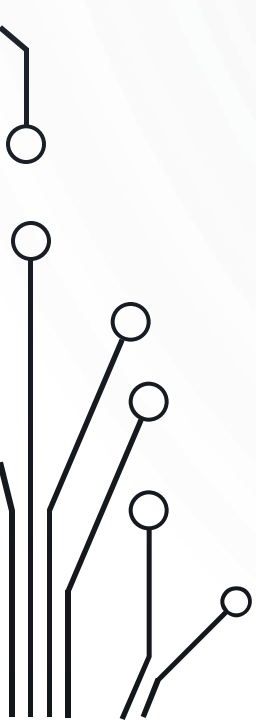
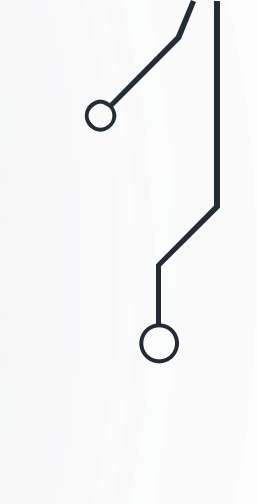
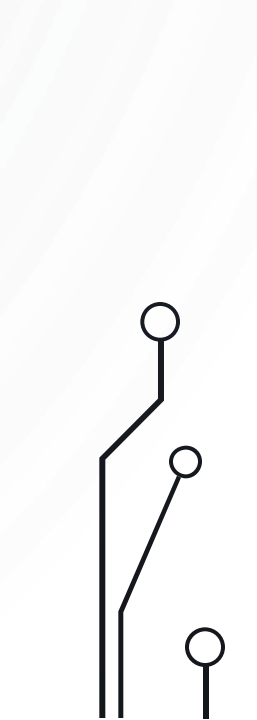


polar

ZAPLAVENÁ OSTRAVA



POŽADAVEK

- Kamerová kontrola (ne)přítomnosti vyrobených kusů
 - V případě detekce problému pozastavit automatický chod stroje
- 
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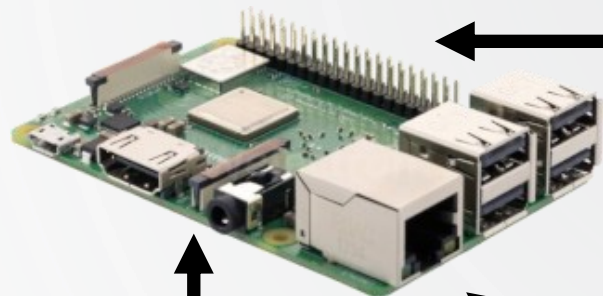


Průmyslová řešení

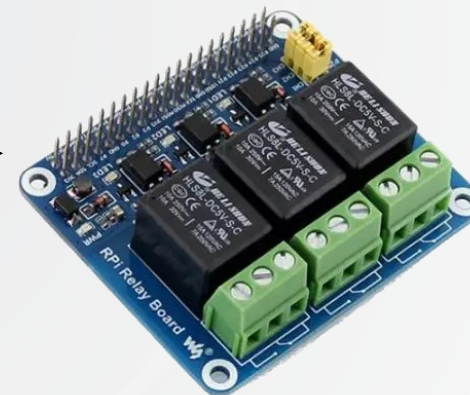
(Keyence, Cognex
Omron, IFM,
Baumer,...)

Raspberry Pi
+
Opensource

Raspberry Pi 3B
(Raspbian, C++
OpenCV, Qt)



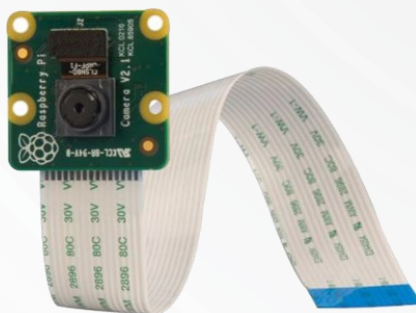
Reléový modul



IO komunikace
(Wiringpi)

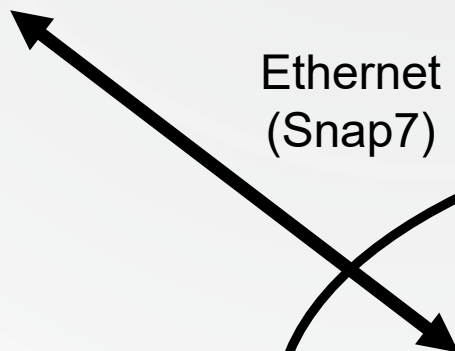


MIPI CSI-2
(RaspiCam)



Kamerový modul

Ethernet
(Snap7)

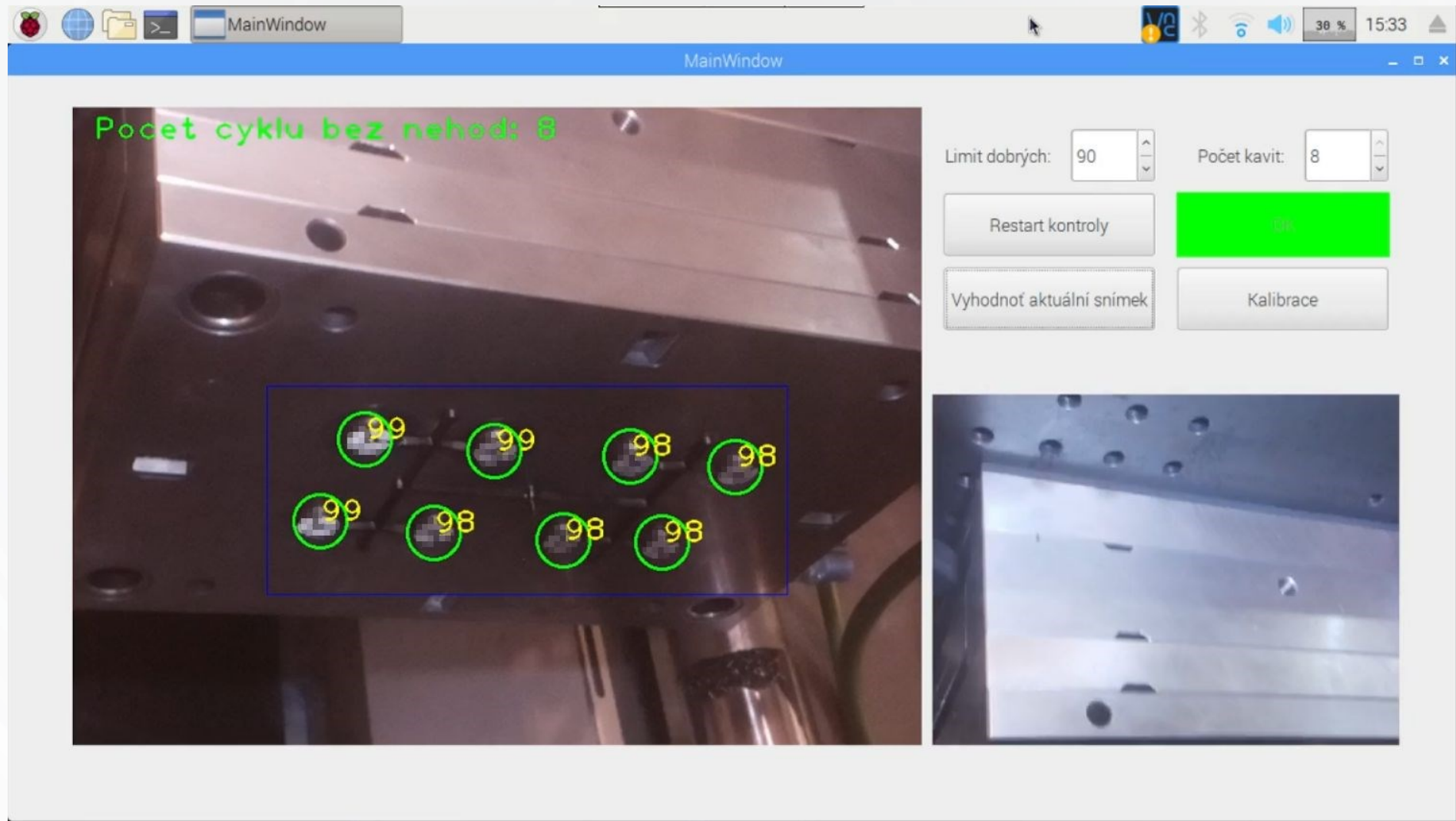


PLC
(Simatic)

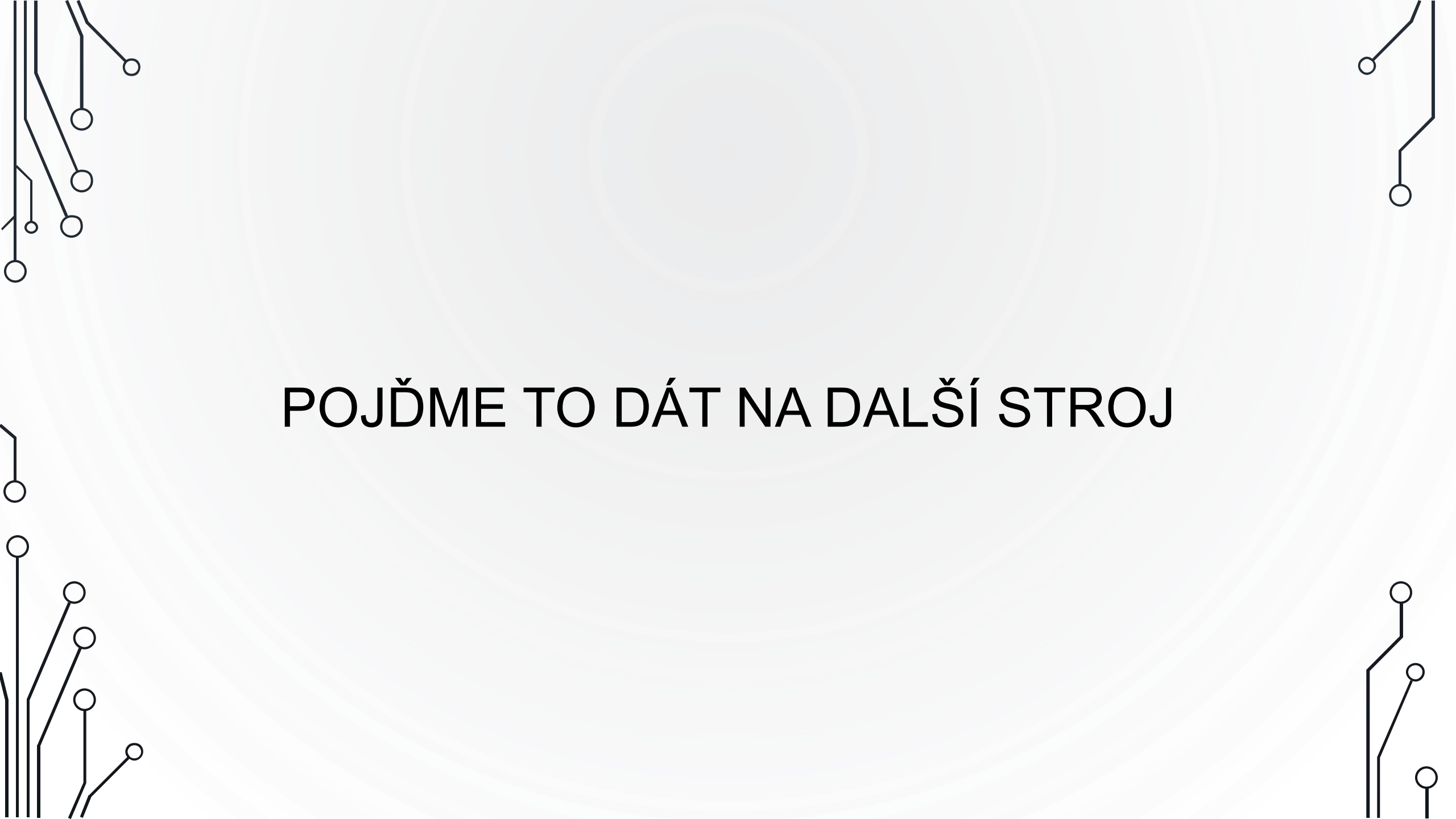


Stroj

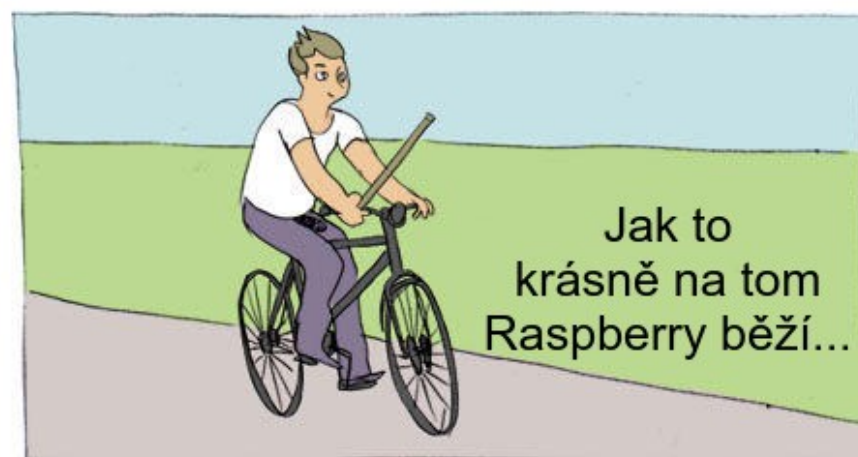




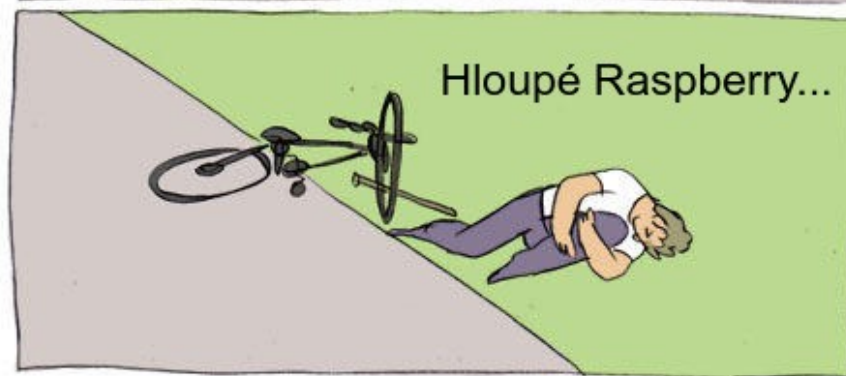


The image features a light gray background with a subtle pattern of concentric circles. In the four corners, there are decorative black line art elements resembling circuit traces or neural network connections, with small circles at the end of the lines.

POJĎME TO DÁT NA DALŠÍ STROJ



Raspberry 3 → 4
Debian 11 → 12
OpenCV 3 → 4
Qt 5 → 6



Dostupnost Raspberry Pi

březen 2022

květen 2022

srpen 2022

MINIPROBLÉM

- Nepasuje krabička – konektory USB a Ethernet jsou prohozené
- MicroHDMI vs HDMI



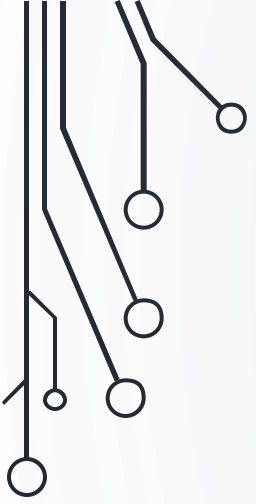
Raspberry Pi 3B



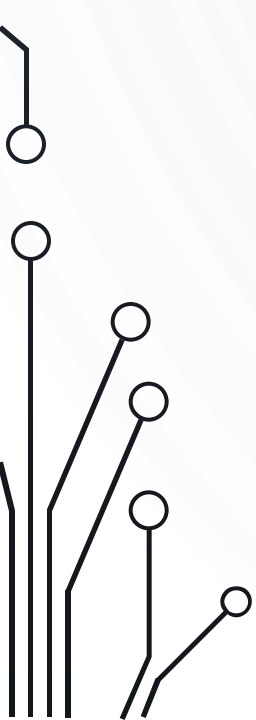
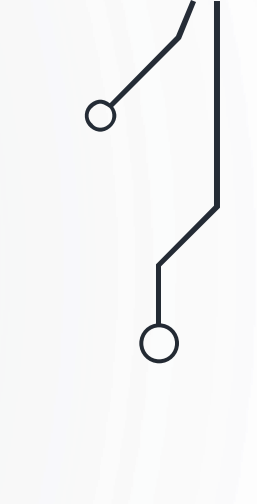
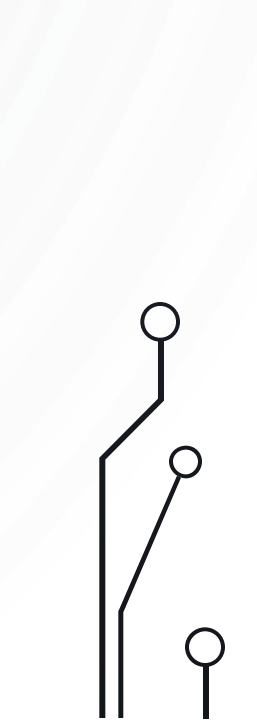
Raspberry Pi 4

Raspberry Pi 5 má USB a Ethernet prohozené zase zpět





PROBLÉM

- Kompilace knihovny OpenCV 4 vytuhne
 - 1GB RAM je na „default“ nastavení málo
- 
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```
BUILD_PNG *OFF
BUILD_PROTOBUF *ON
BUILD_SHARED_LIBS *ON
BUILD_TBB *OFF
BUILD_TESTS *ON
BUILD_TIFF *OFF
BUILD_USE_SYMLINKS *OFF
BUILD_WEBP *OFF
BUILD_WITH_DEBUG_INFO *OFF
BUILD_WITH_DYNAMIC_IPP *OFF
BUILD_ZLIB *OFF
BUILD_opencv_apps *ON
BUILD_opencv_calib3d *ON
BUILD_opencv_core *ON
BUILD_opencv_dnn *OFF
BUILD_opencv_features2d *ON
BUILD_opencv_flann *OFF
BUILD_opencv_gapi *ON
BUILD_opencv_highgui *ON
BUILD_opencv_imgcodecs *ON
BUILD_opencv_imgproc *ON
BUILD_opencv_java_bindings_gen *OFF
BUILD_opencv_js *OFF
BUILD_opencv_js_bindings_generator *OFF
BUILD_opencv_ml *ON
BUILD_opencv_objc_bindings_gen *ON
BUILD_opencv_objdetect *ON
BUILD_opencv_photo *ON
```

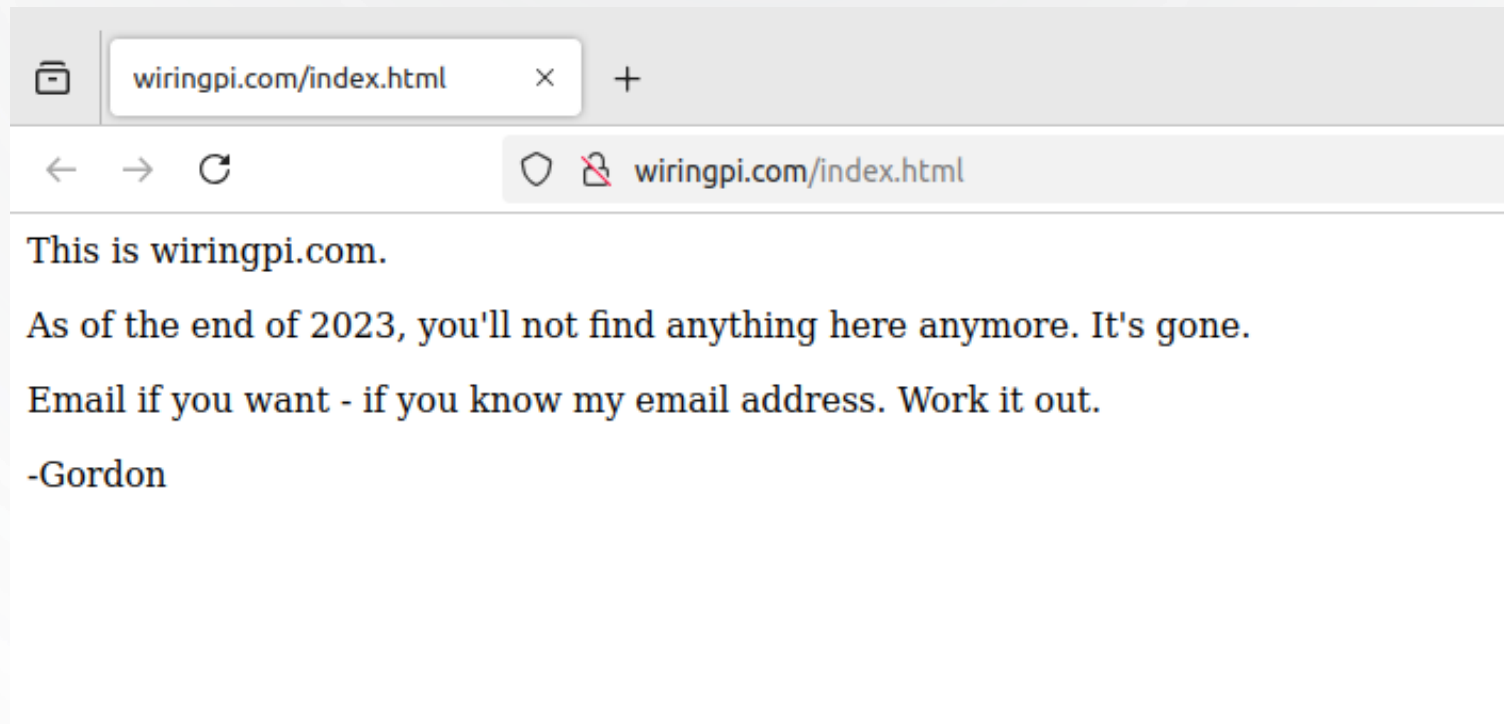
BUILD_opencv_js_bindings_generator: Include opencv_js_bindings_generator module into the OpenCV build

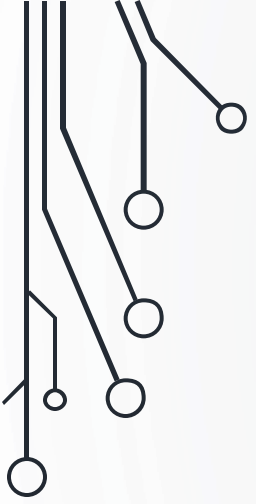
Keys: [enter] Edit an entry [d] Delete an entry
[l] Show log output [c] Configure
[h] Help [q] Quit without generating
[t] Toggle advanced mode (currently off)

CMake Version 3.25.1

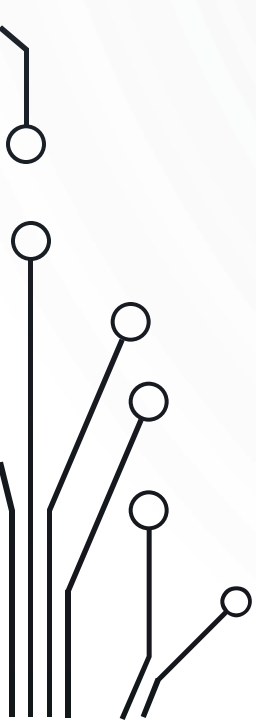
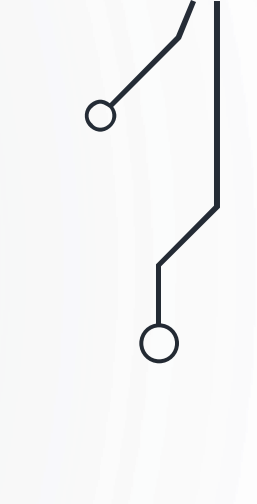
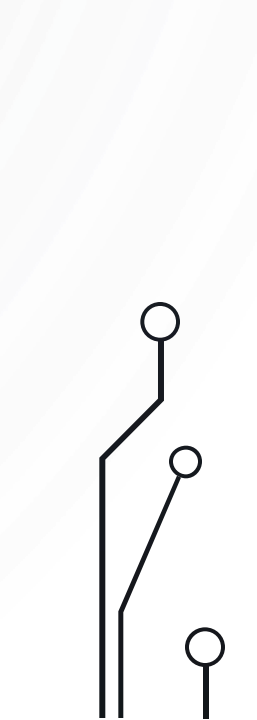
PROBLÉM

- Knihovna Wiringpi pro GPIO komunikaci již není podporovaná

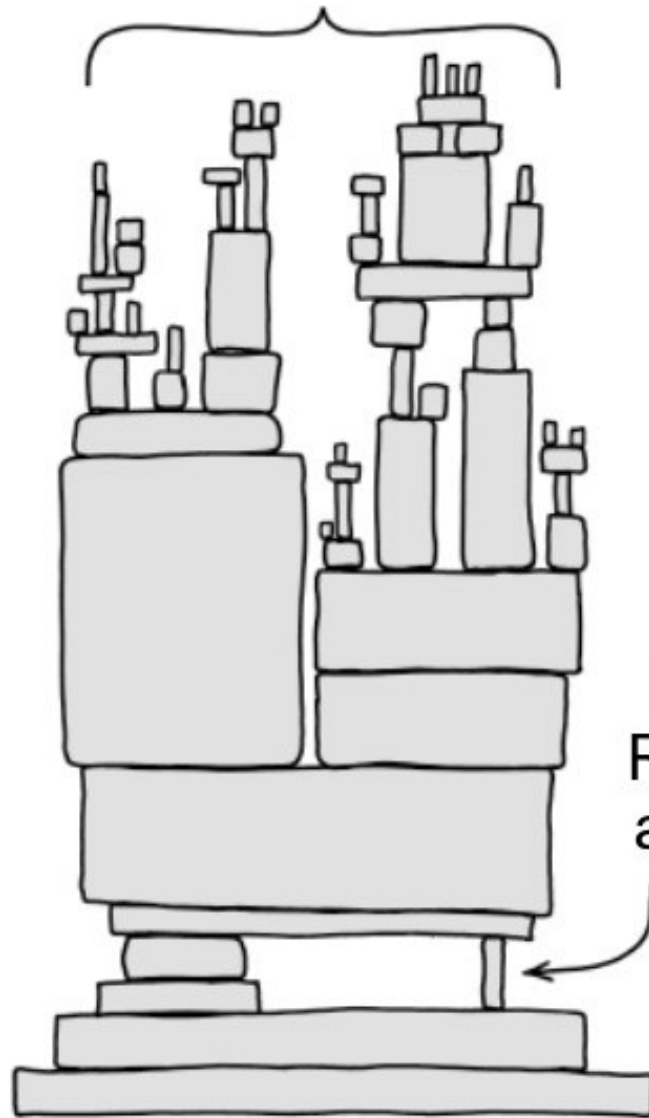




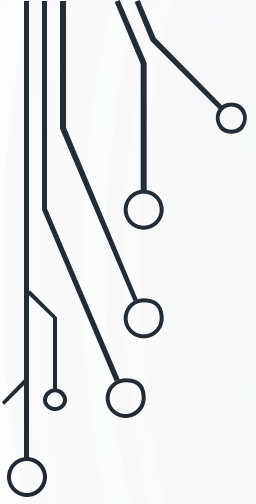
PROBLÉM

- Změnil se přístup ke kameře - přešlo se z MMAL na libcamera
 - Knihovnu RaspiCam pro snadné grabnutí obrázku z kamery rovnou do OpenCV nelze použít
- 
- 
- 

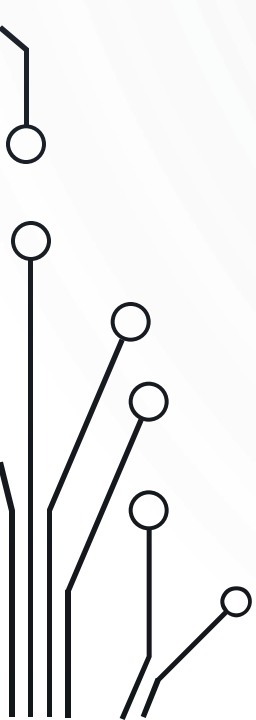
Kamerová kontrola

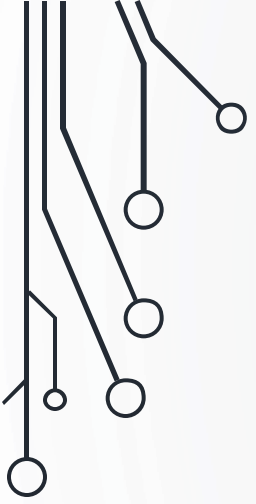


knihovny
RaspiCam
a Wiringpi

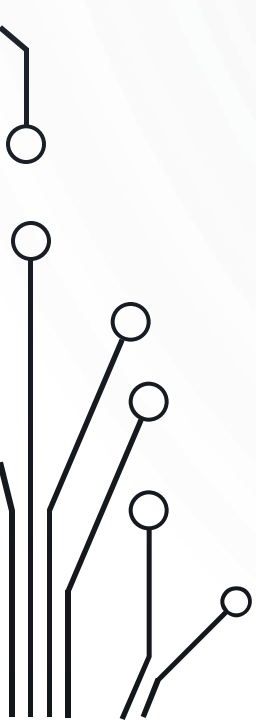
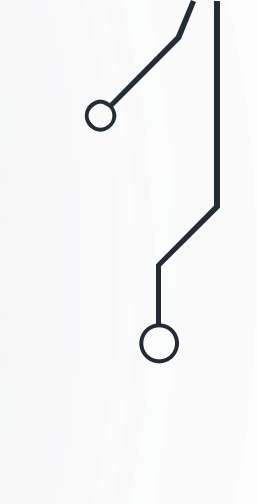
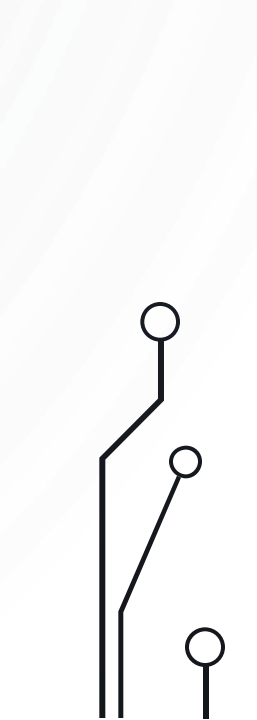


PROBLÉM

- Kód programu nelze zkompileovat
 - Knihovna libcamera používá funkce signals, slots a emit, což jsou v Qt klíčová slova
 - Nutno zapnout QT_NO_KEYWORDS a používat namísto klíčových slov makra Q_SIGNALS, Q_SLOTS, Q_EMIT
- 



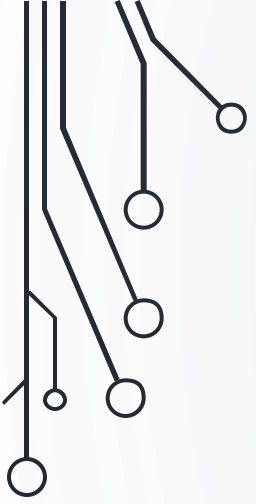
PROBLÉM

- Kód programu nelze zkompileovat
 - Chyba u spouštění funkce v samostatném vlákně pomocí `QtConcurrent::run()`
- 
- 
- 

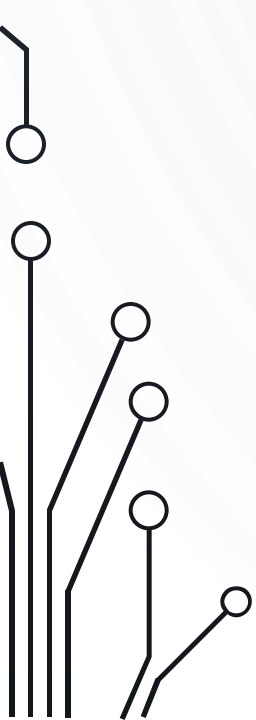
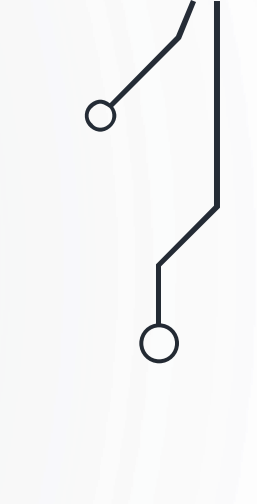
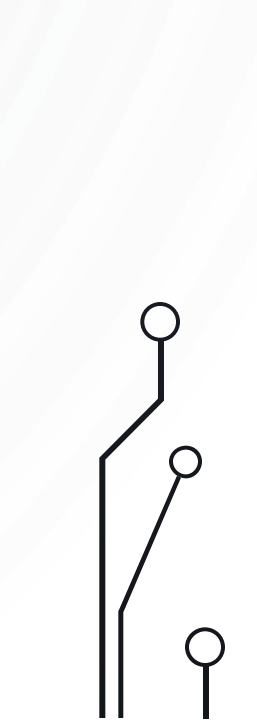
Qt5:
QtConcurrent::run(this, &MyWnd::preview);

Qt6:
QtConcurrent::run(&MyWnd::preview, this);

imgflip.com

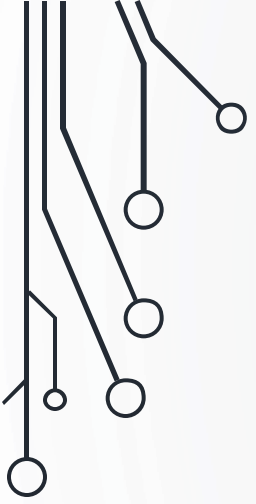


PROBLÉM

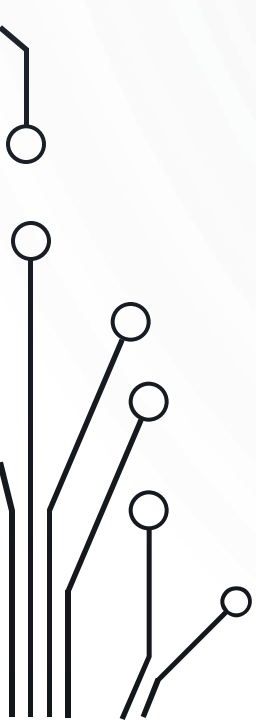
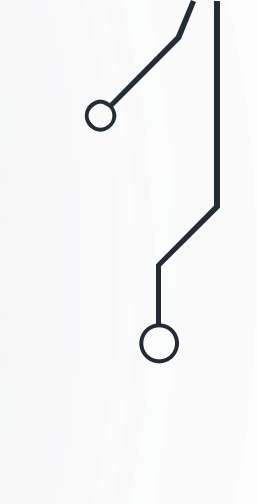
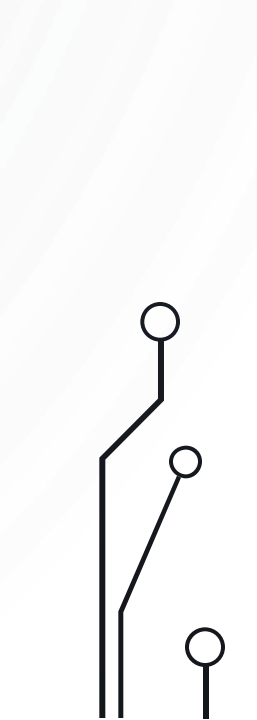
- Stroj (PLC) má konfliktní IP adresu a nemůže být připojen do podnikové sítě
 - Oprava na straně PLC „nežádoucí“ (ať se něco nepokazí)
- 
- 
- 

The background of the image features a light gray gradient with faint, concentric circular patterns. In each of the four corners, there are stylized black line drawings of circuit traces or a network topology, consisting of lines and small circles representing nodes or components.

```
zyzzy@Pizyzy:~ $  
zyzzy@Pizyzy:~ $  
zyzzy@Pizyzy:~ $ route -n  
bash: route: command not found  
zyzzy@Pizyzy:~ $  
zyzzy@Pizyzy:~ $  
zyzzy@Pizyzy:~ $ ifconfig  
bash: ifconfig: command not found  
zyzzy@Pizyzy:~ $  
zyzzy@Pizyzy:~ $ █
```

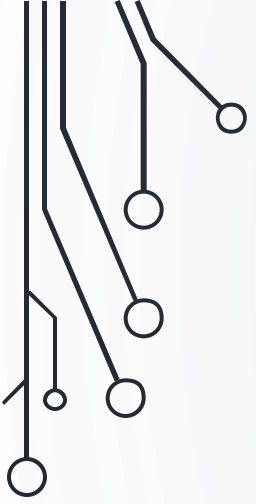


BUG

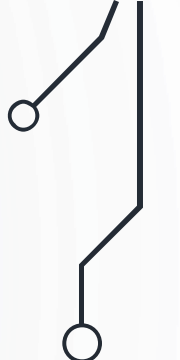
- Aplikace občas spadne
 - Nastává na jednom stroji, někdy po pár hodinách, jindy po pár dnech
- 
- 
- 

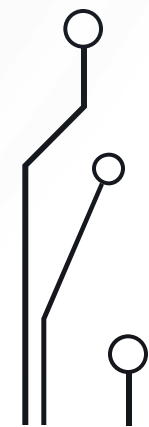
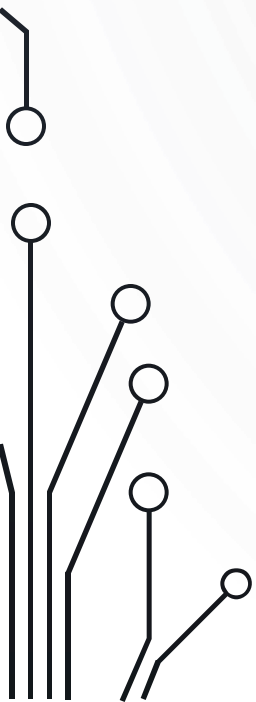
Aplikace už nepadá

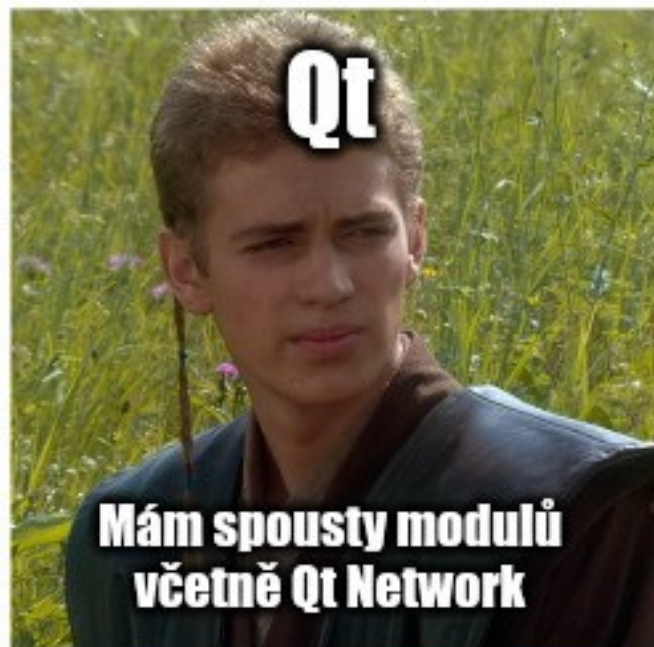
**#!/bin/sh
while true
do
./KamKontrola
done**

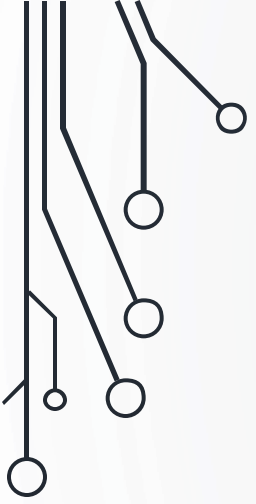


POŽADAVEK

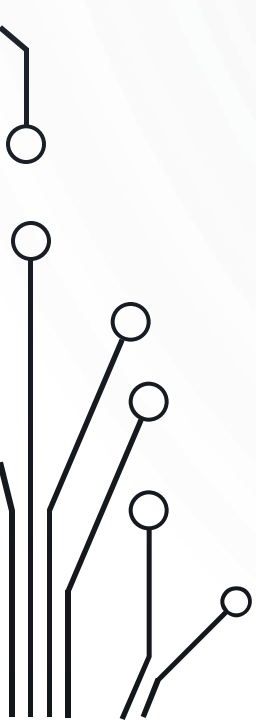
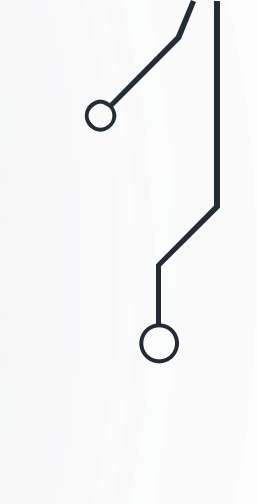
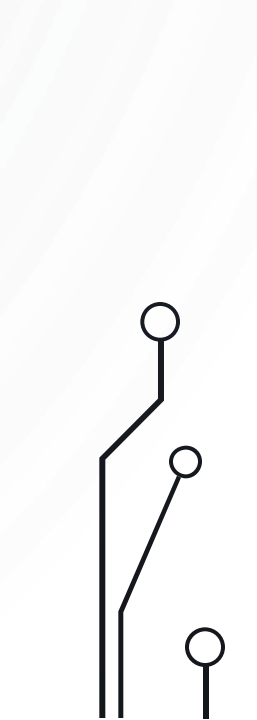
- Necht' stroj při některých událostech pošle mail
- 



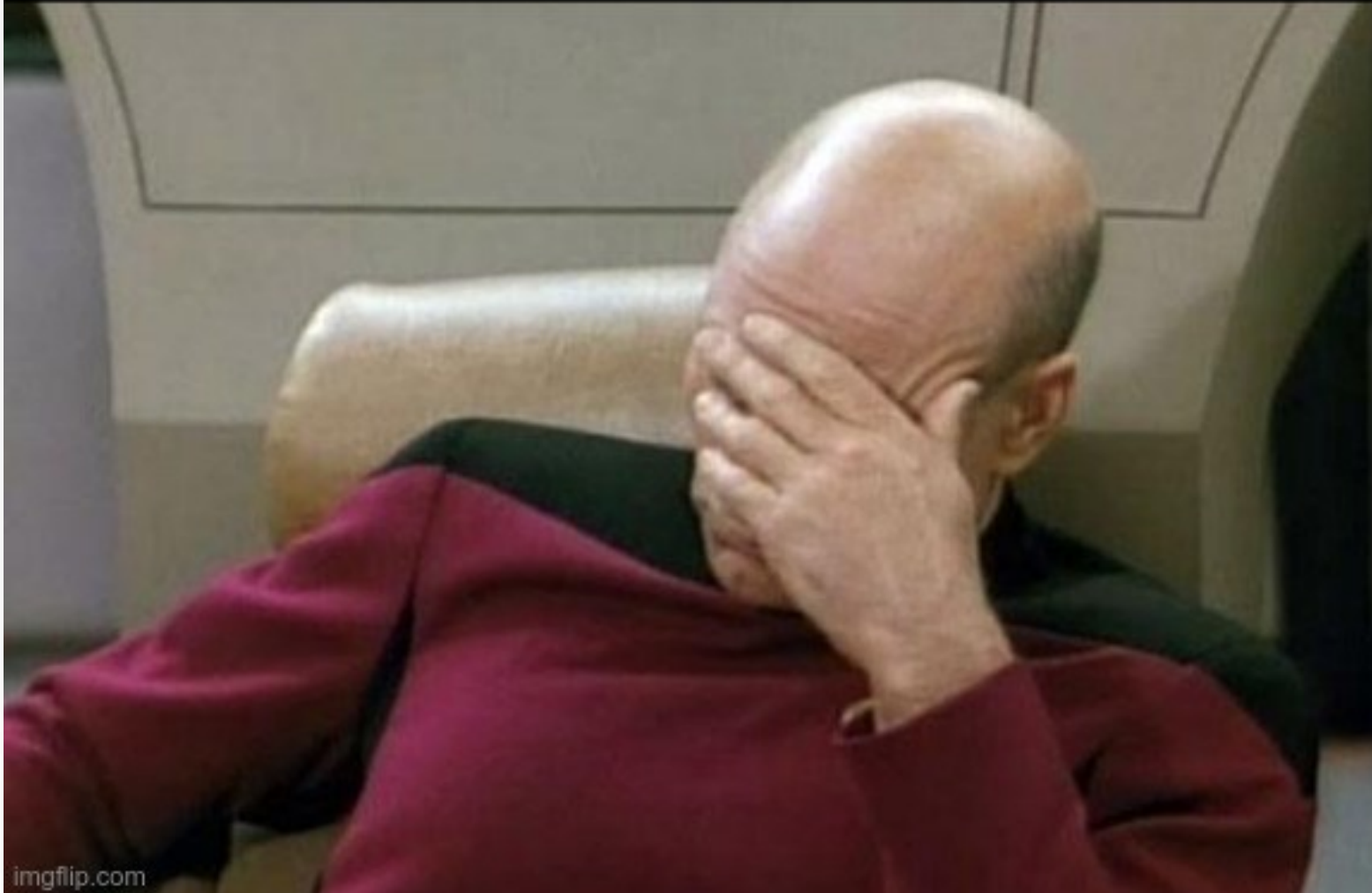




MALÝ PROBLÉM

- IT migrovalo SMTP server
 - Problém s přihlášením k novému serveru. „Ručně“ funguje.
- 
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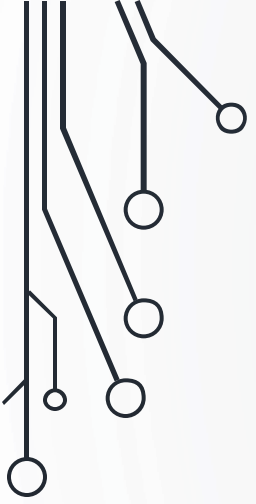
```
QString strPass = "k;P&B_AY\0#%rm3";
```



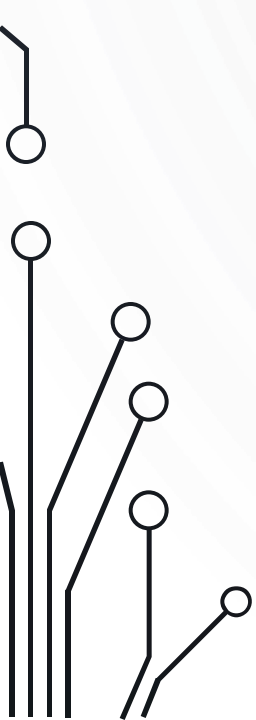
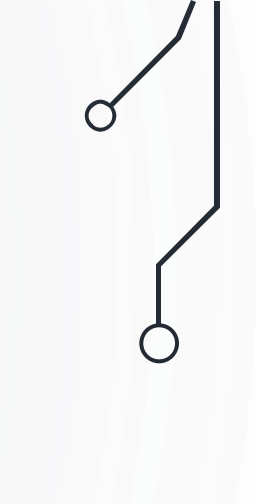
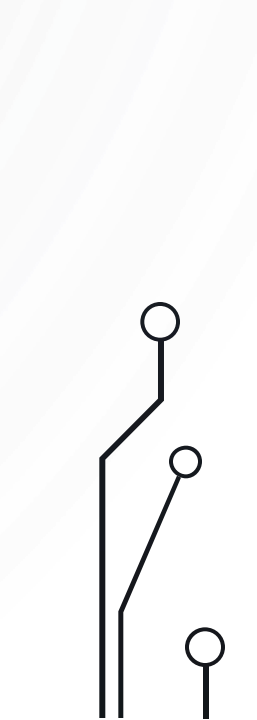
KOLEGOVÉ

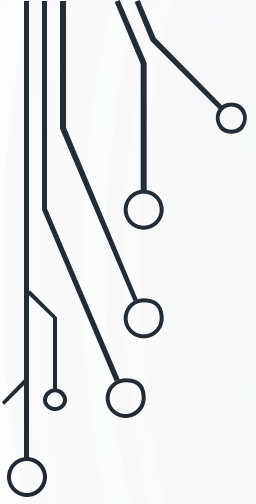
- „Pro další podobný projekt použijme ověřené řešení!“
- „Ověřené“ řešení : PC + kamery Basler (PoE + IO)
- Software : GNU/Linux, Basler Pylon, OpenCV, Qt



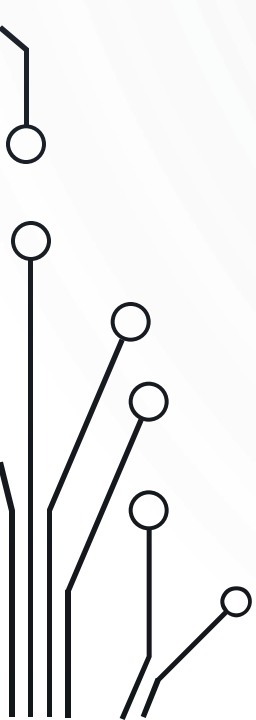
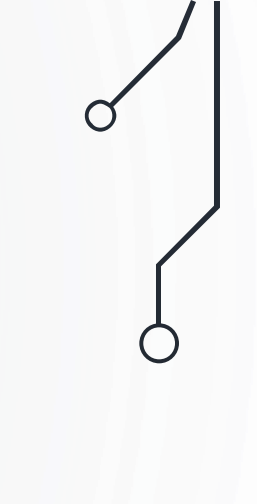
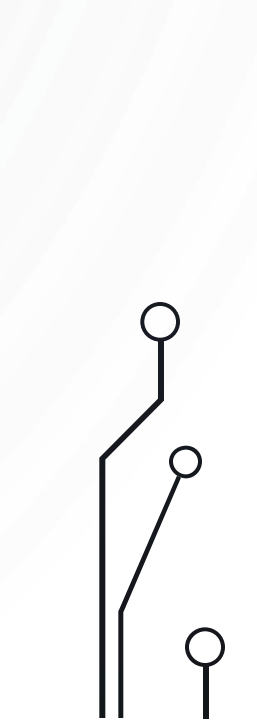


PROBLÉM

- Kamera Basler se náhodně odpojuje
 - Na vině PoE switch DLink, chyba opravena hotfixem firmware
- 
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PROBLÉM

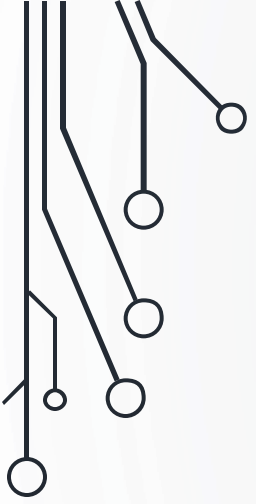
- Kamera ne vždy nastaví požadovaný digitální výstup
 - Funkce SetValue() funguje cca s 80% pravděpodobností
- 
- 
- 

Takže ta komunikace je už v pořádku...

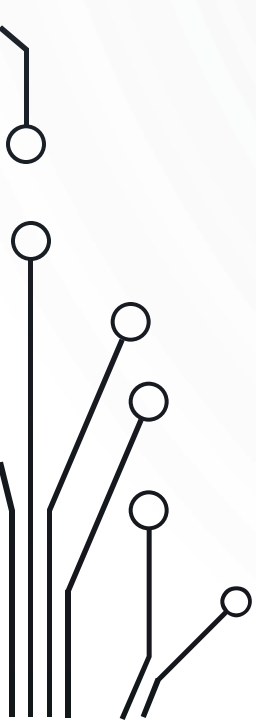
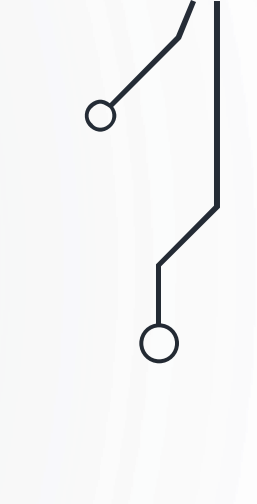
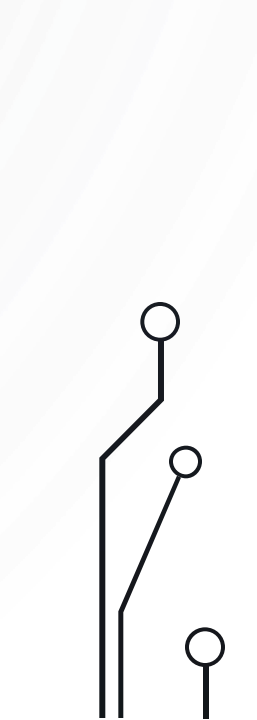
```
while (output.GetValue() != result)  
    output.SetValue(result);
```



imgflip.com



PROBLÉM

- Všechny kamery v síti ztratí spojení
 - Nastává po zapnutí počítače s Kubuntu
- 
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Ověřené řešení s kamerami Basler



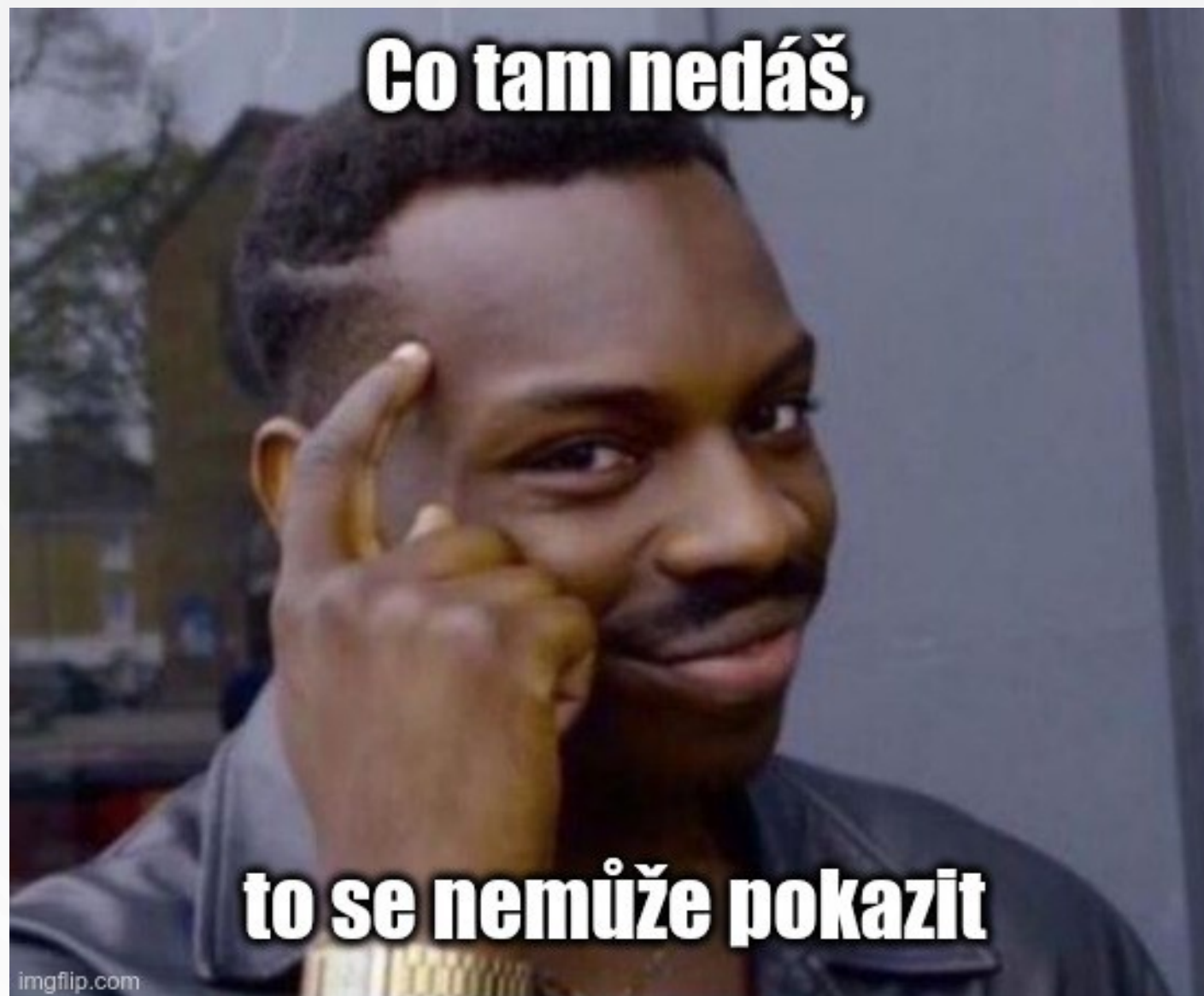
imgflip.com

The image features a light gray background with a subtle pattern of concentric circles. In the four corners, there are decorative black line art elements resembling circuit traces or neural network connections, with small circles at the end of the lines.

PONAUCENÍ?

Když to funguje,

nesahej na to



Co tam nedáš,

to se nemůže pokazit

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