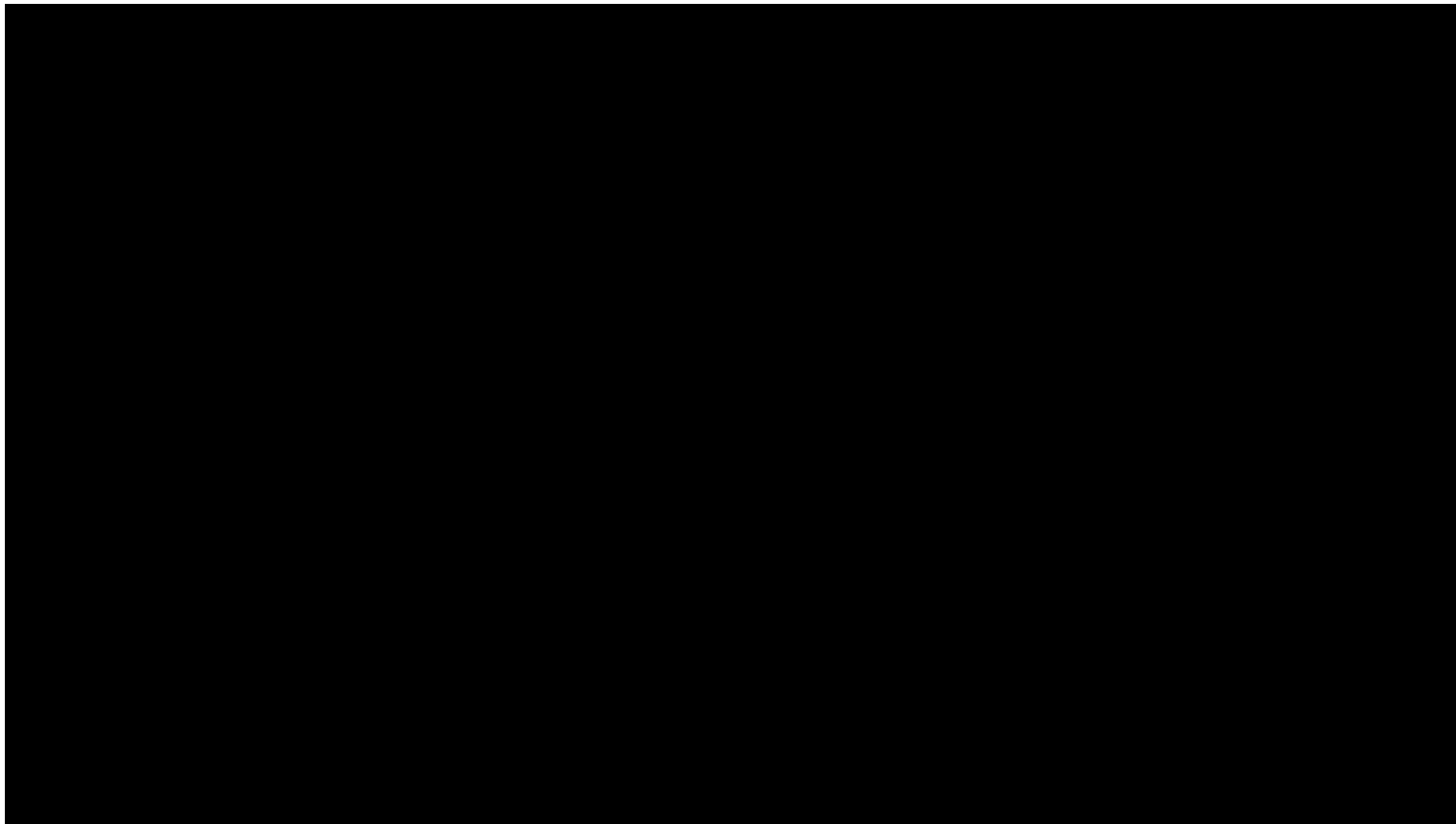


Výučbový robot vytvorený na 3D tlačiarňi

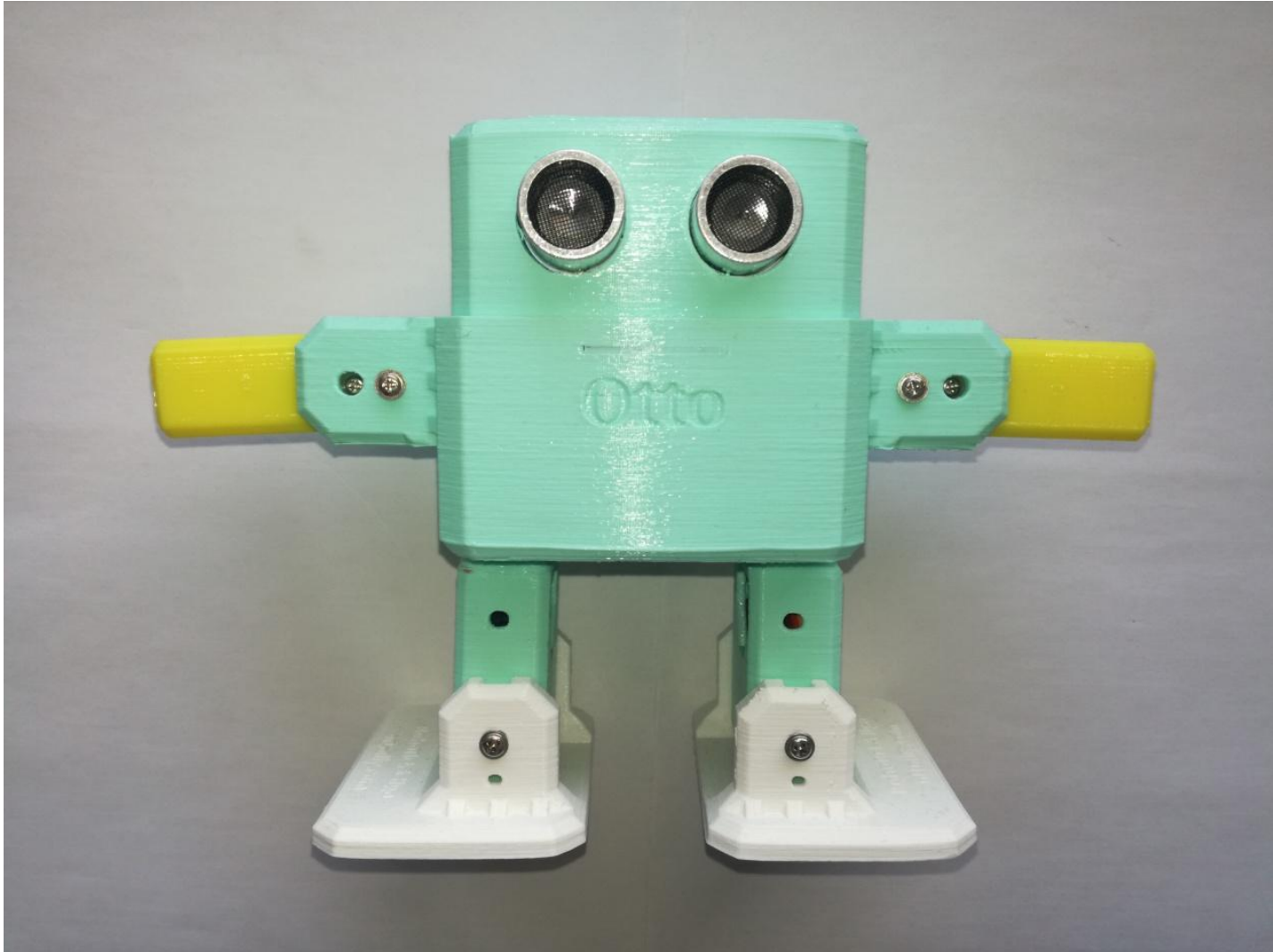
Študent: Martin Stolárik
Vedúci: Mgr. Pavel Petrovič, PhD.

Východisko, motivácia

- ▶ Výučba robotiky a programovania, tábory, krúžky
- ▶ Robot Otto



Robot Otto



Programovanie robota Otto

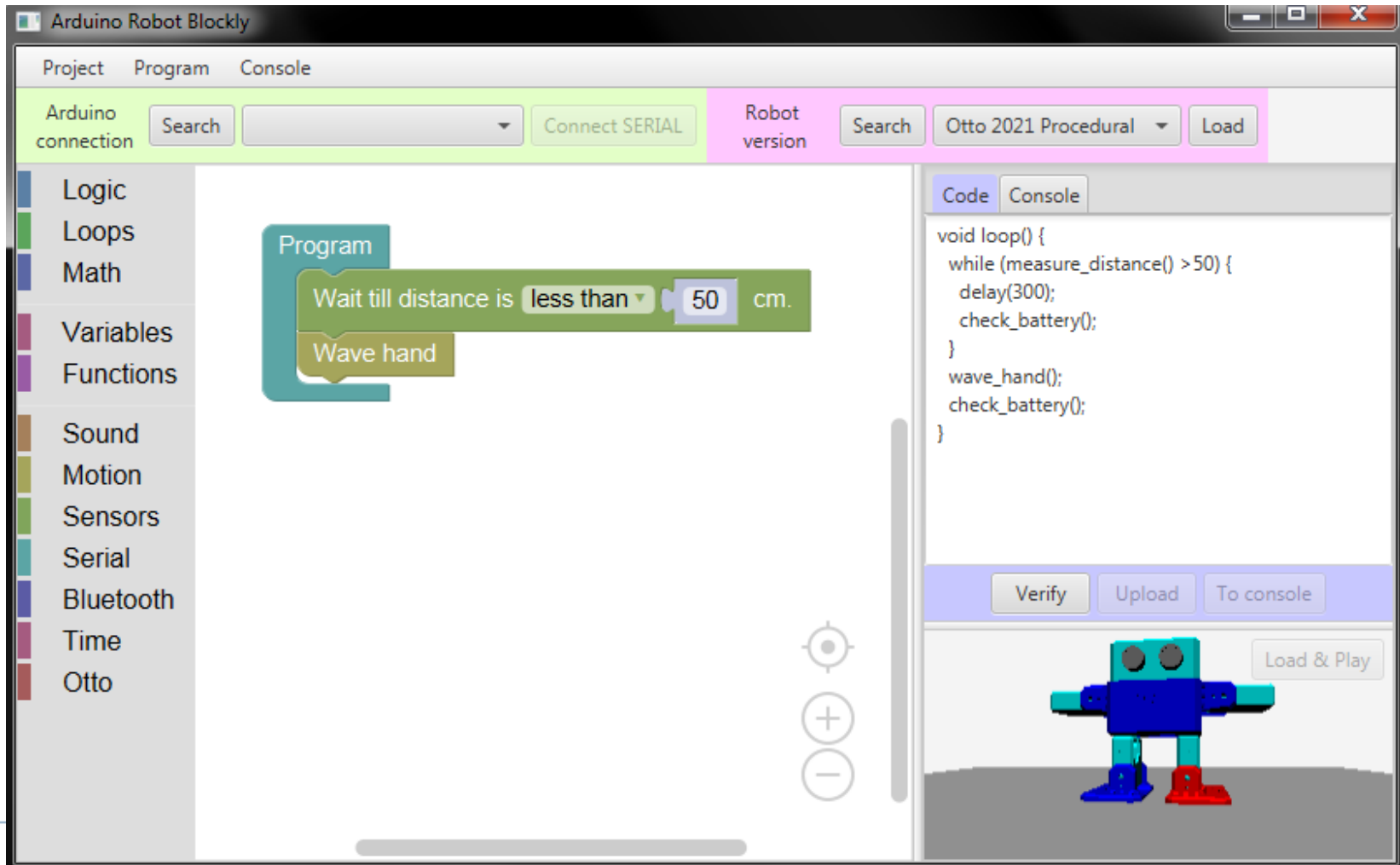
- ▶ Statický riadiaci program, terminál, sériová komunikácia

Príkaz	Interpretácia
;/p	pravá ruka
z/x	ľavá noha
-	zvukový pozdrav
R	ruky hore-dole
U	testuje ultrazvuk
l/9	zníž/zvýš rýchlosť pohybu
B	zapni/vypni reproduktor
F	zahraj MP3
*,/+,!,%	zahrá melódiu 1-6
@	načítanie choreografie

```
@1000 1 120
1000 1 60
1000 1 90
1000 2 120
1 1 120
1000 2 90
1 1 90
0 0 0
```

Desktopová aplikácia

- ▶ GUI, VPJ (Blockly), terminál, simulácia



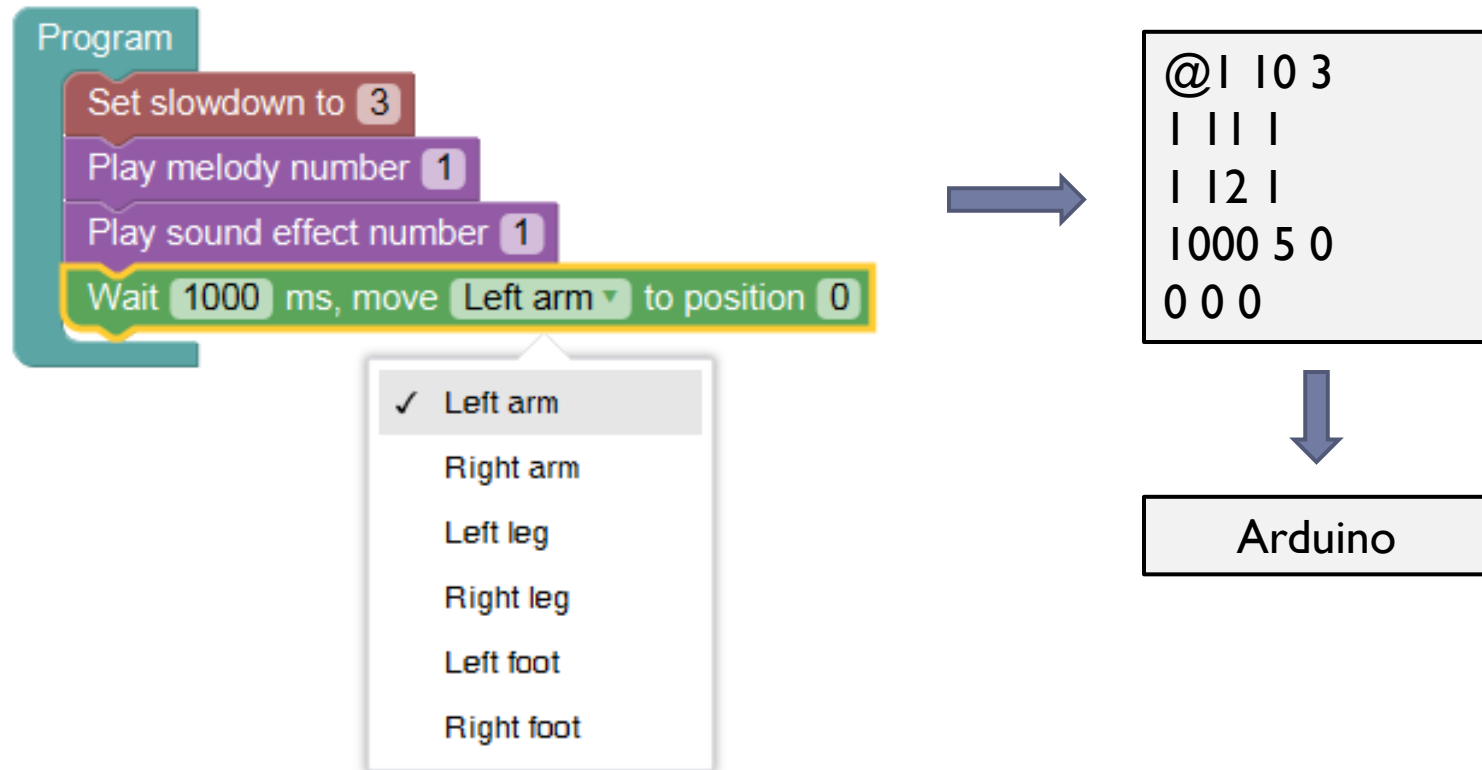
Vizuálny programovací jazyk

► Blockly, integrácia pomocou WebView

The image displays a collection of Blockly code blocks. On the left, a 'Program' block contains a 'Wait till distance is less than 50 cm.' block followed by a 'Wave hand' block. Below it is a 'count with i from 1 to 100 by 1' block with a 'do' loop containing an 'if i is even' block and a 'print i' block. To the right, there is a 'count with item from 1 to 10 by 1' block with a 'do' loop. Below that is a 'repeat while' block with a 'do' loop. Next to it is a 'repeat 10 times' block with a 'do' loop containing a 'break out of loop' block. A tooltip is visible over the 'break out' block, showing a checked option 'break out' and an unchecked option 'continue with next iteration'. At the bottom, there are four media control blocks: 'Play song number 1', 'mp3 player pause', 'Set volume level of mp3 to 15', and 'Volume of mp3 player'.

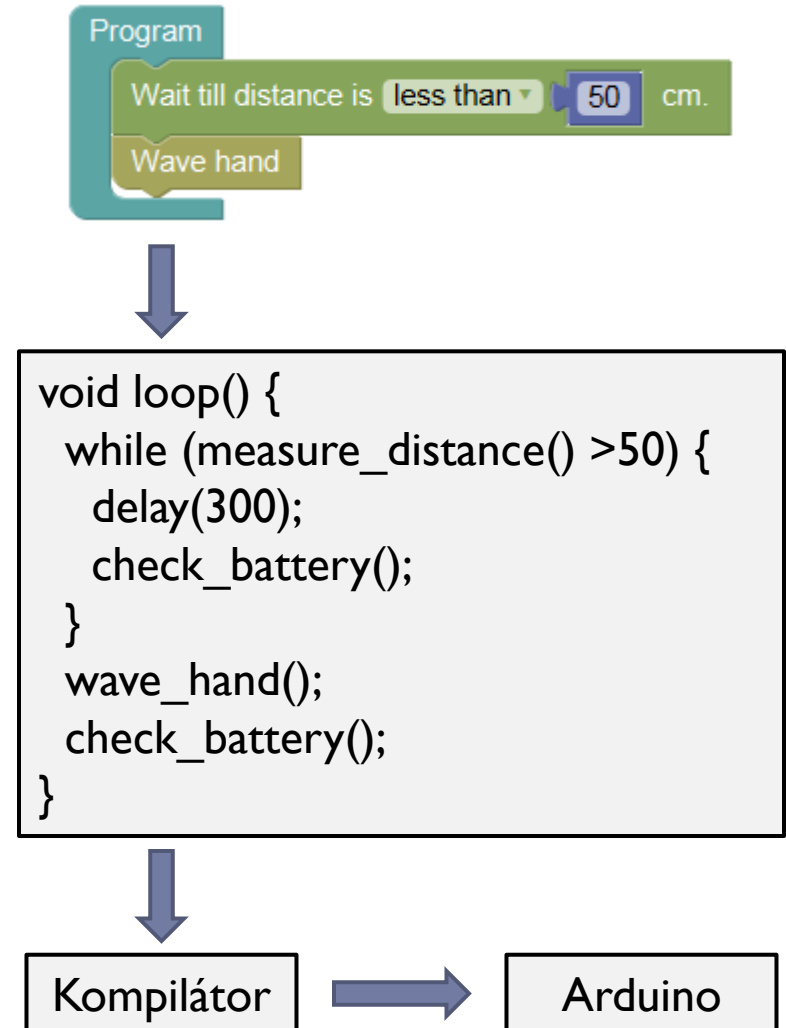
Verzia Otto 2020 Robotická liga

- ▶ Nadviazanie na existujúcu verziu
- ▶ Simulácia



Verzia Otto 2021 Procedural

- ▶ Cykly
- ▶ Premenné
- ▶ Matematika
- ▶ Matematická logika
- ▶ Funkcie a procedúry
- ▶ Zvuk
- ▶ Pohyb
- ▶ Senzory
- ▶ Sériová komunikácia USB
- ▶ Sériová komunikácia Bluetooth



Komponenty VPJ

▶ Abstrakcia, kontrola batérií

Left button is pressed

Wait till left button is pressed.

Touch - record gesture on left button.

Touch - last seen gesture

Ultrasound distance

Wait till distance is more than 50 cm.

Ultrasound - record gesture.

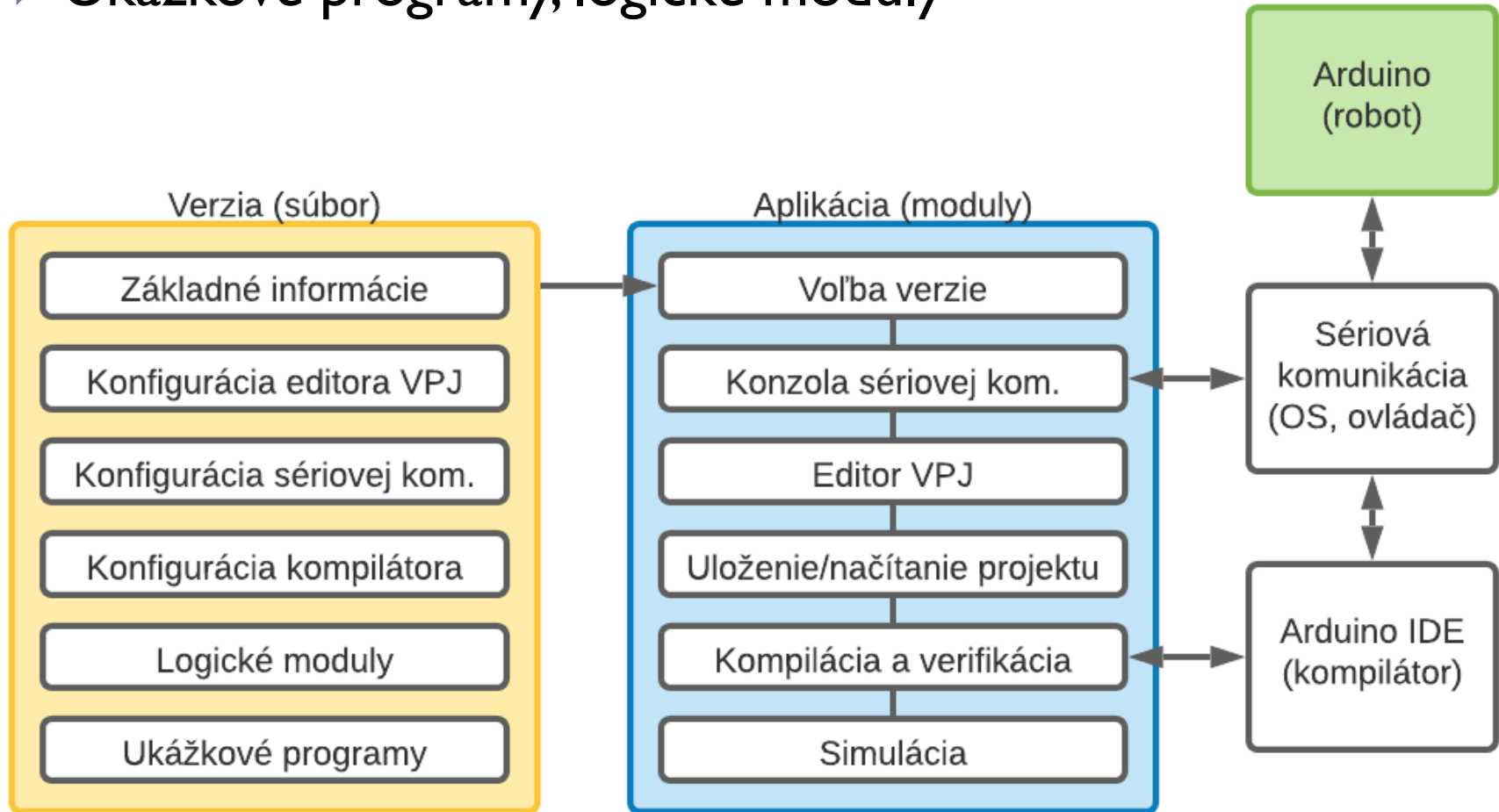
Ultrasound - last seen gesture

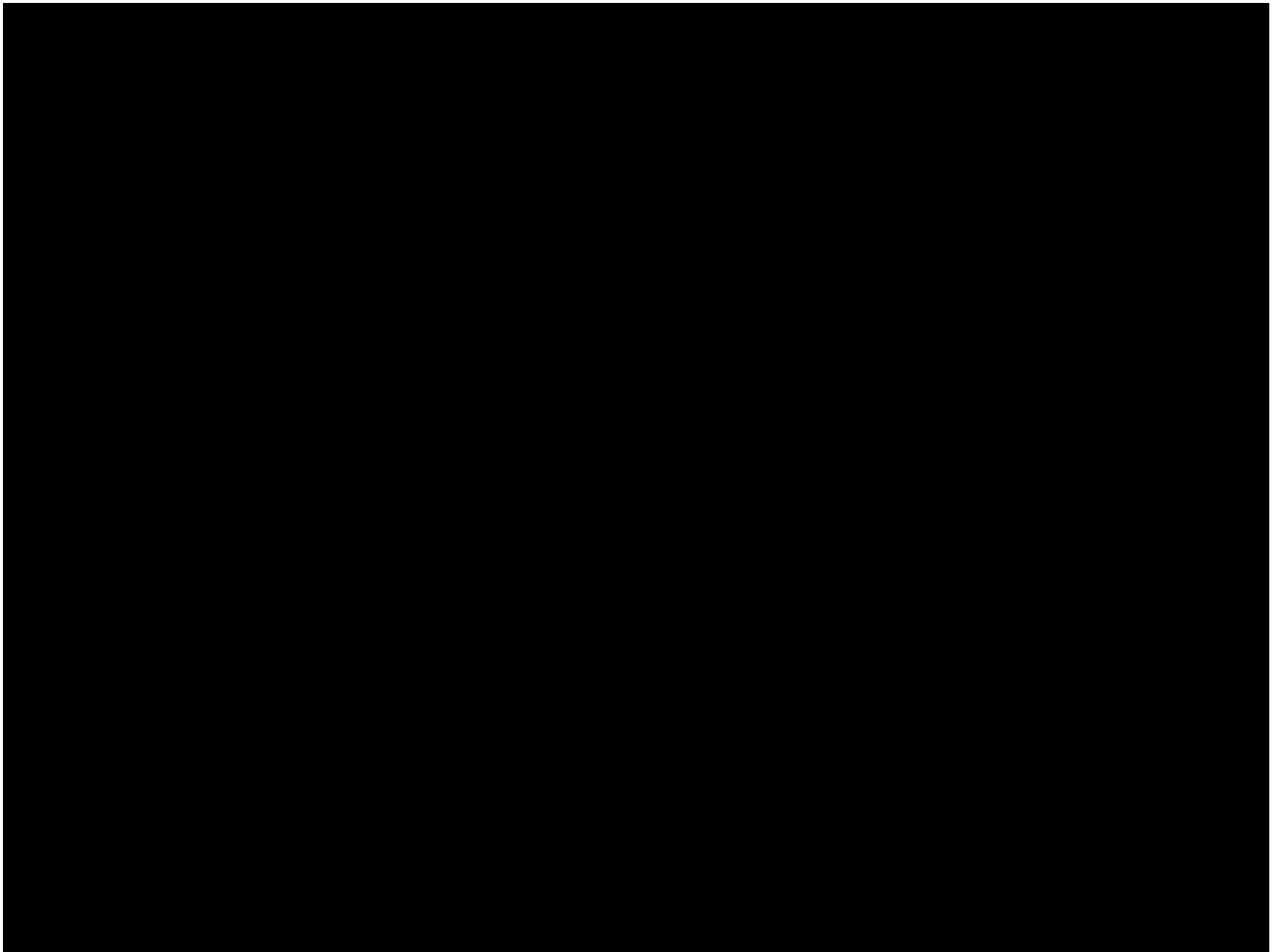
repeat while not Left button is pressed
do

Wait till left button is pressed.

System verzií a modulov

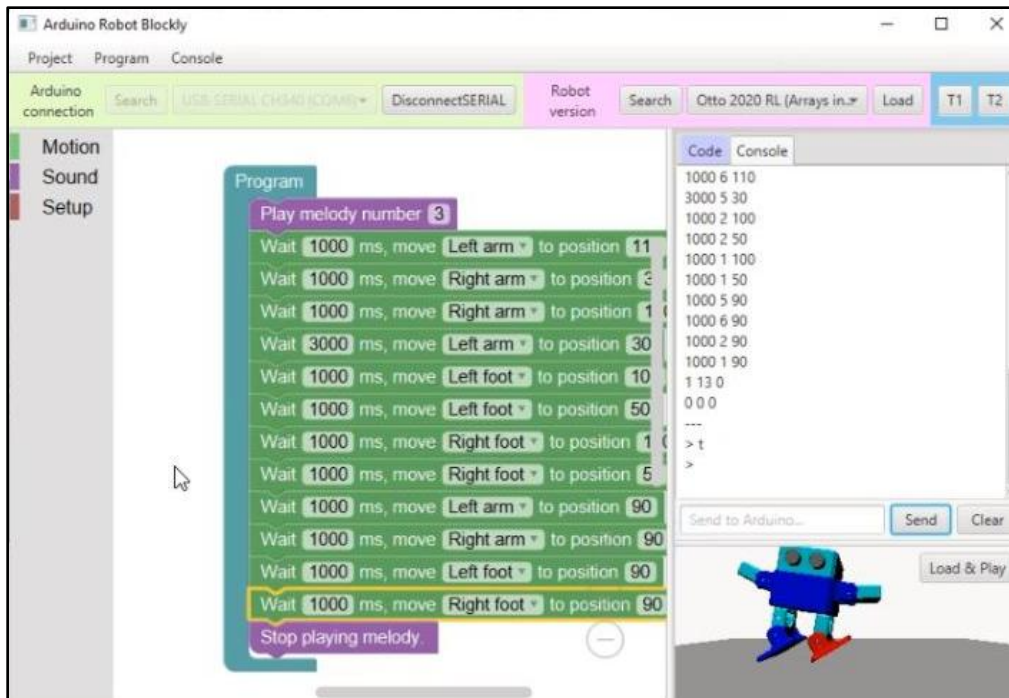
► Ukážkové programy, logické moduly





Experiment

- ▶ Účastníčka robotického krúžku
- ▶ Skúsenosť s robotom Otto



Zhrnutie, možné rozšírenia

- ▶ Aplikácia s GUI
- ▶ Systém verzií
- ▶ Systém modulov
- ▶ Vizualný programovací jazyk
- ▶ Terminál
- ▶ Kompilátor
- ▶ Ukážkové programy
- ▶ Simulácia

Výučbový robot vytvorený na 3D tlačiarňi

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Priame príkazy

