Table 1: Characteristics of bridge circuit used by the authors

Property	**Value**
Analog input voltage range	0 V to 5 V
Analog input resolution	1024
Analog output type	PWM
Analog output voltage range	0 V to 5 V
Analog output resolution	256
Baud rate for RS232 protocol	$115\,200\,\mathrm{bit\,s^{-1}}$

1 Tables

2 Figures

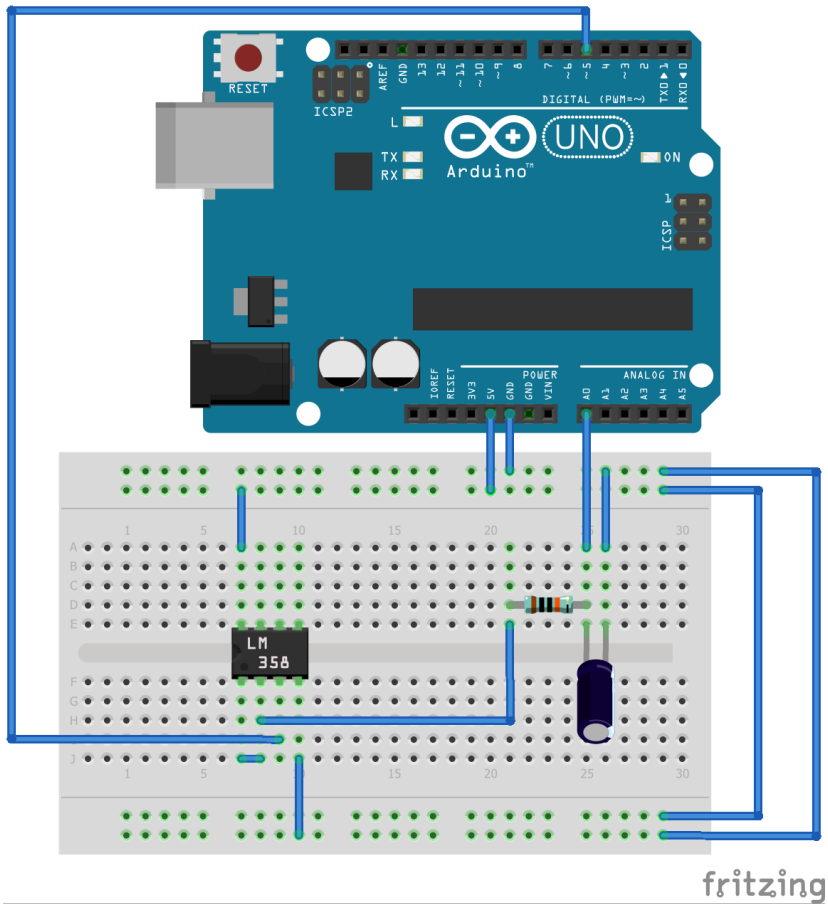

Figure 1: Bridge and RC circuit

```
1: Initialize USB CDC
2: while 1 do
3:     Receive from USB and store in A
4:     if A[0] == 1 then
5:         Set A[1] as PWM out
6:     end if
7:     if A[0] == 2 then
8:         Read Analog input and store in B
9:         Send B to USB
10:    end if
11: end while
```

Figure 2: Bridge device's firmware

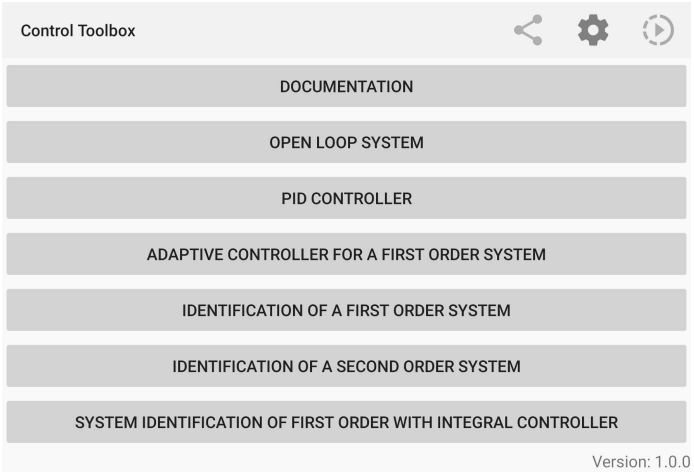

Figure 3: Android App home screen

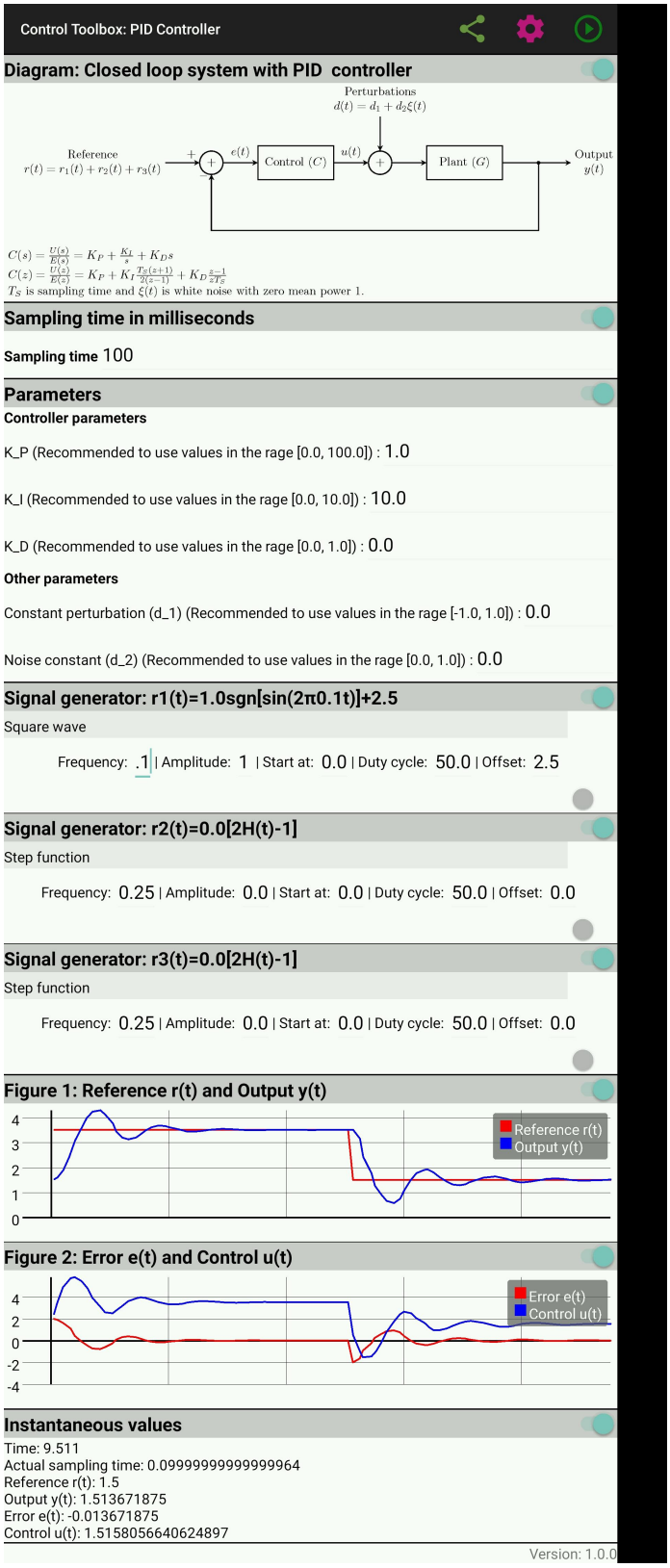

Figure 4: Android App running closed loop control system with PID controller when bridge circuit is connected to a low pass filter

```
1:  Initialize USB CDC
2:  while 1 do
3:      Receive from USB and store in A
4:      if A[0] == 1 then
5:          Set A[1] as PWM out
6:      end if
7:      if A[0] == 2 then
8:          Read Analog input and store in B
9:          Send B to USB
10:     end if
11: end while
```

Figure 5: Android app implementation of the real-time algorithm

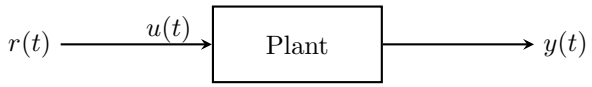

Figure 6: Open loop system

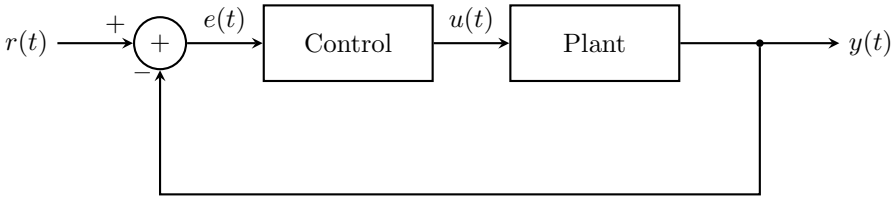

Figure 7: Closed loop system

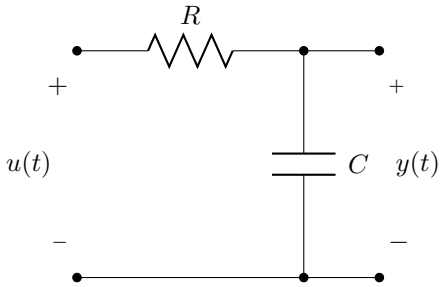

Figure 8: First order low pass filter

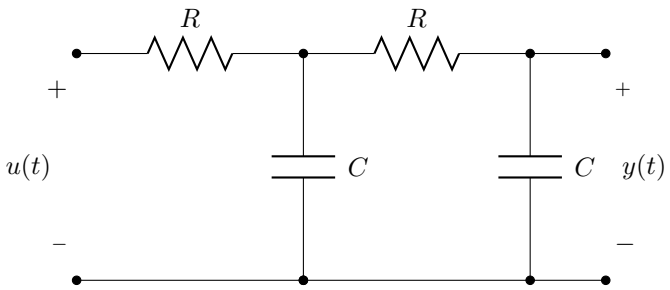

Figure 9: Second order low pass filter.

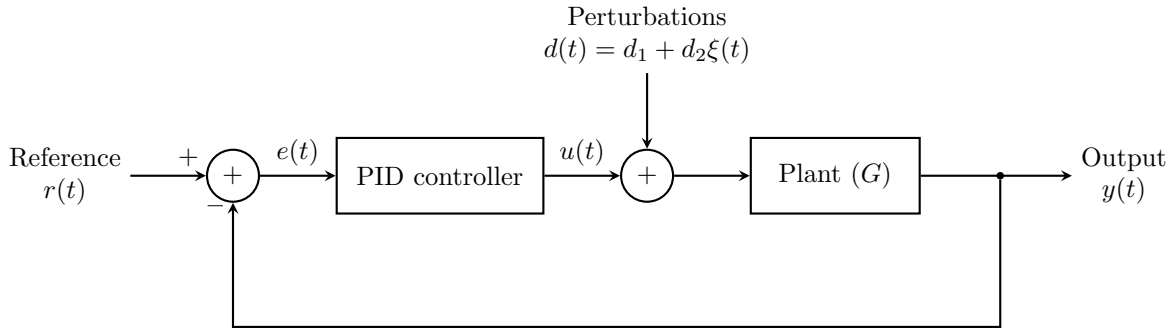

Figure 10: Closed loop system with a PID Controller

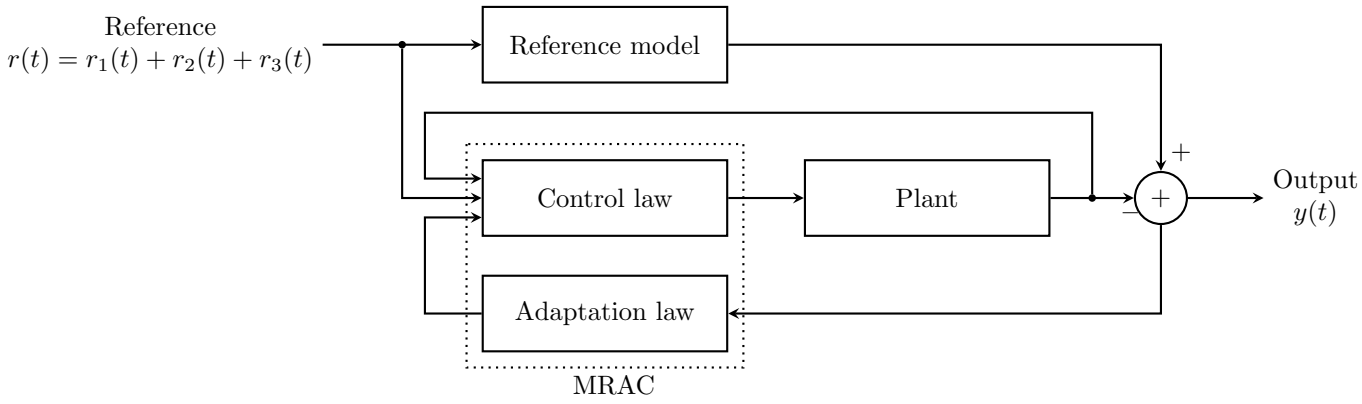

Figure 11: Adaptive control