

# Universidade de Federal do ABC

# Engenharia Unificada I - Protótipo de *Pinball*

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Breve história do Pinball

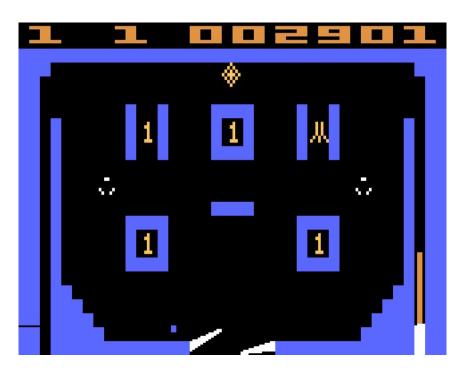


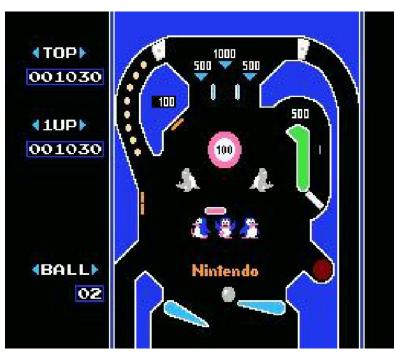
Bagatelle





Máquina de Pinball



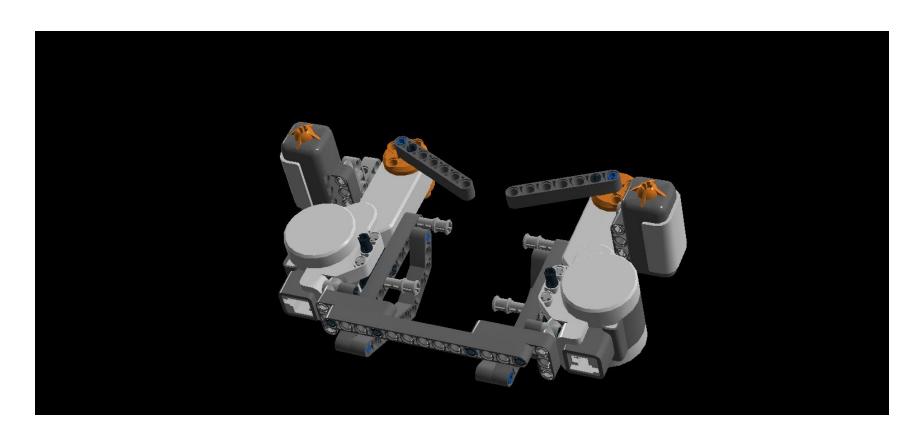


Video Pinball - Atari

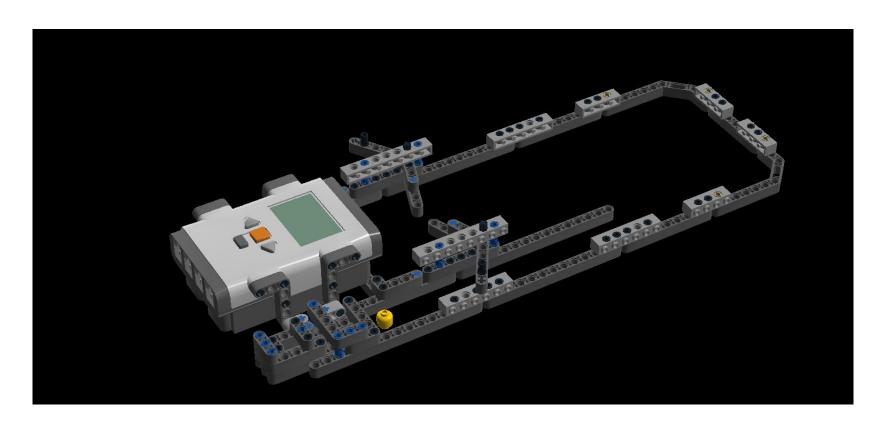
Pinball Wizardry - Nintendo

# Montagem e Design

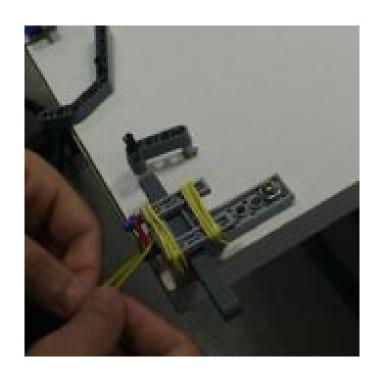
# Primeira versão

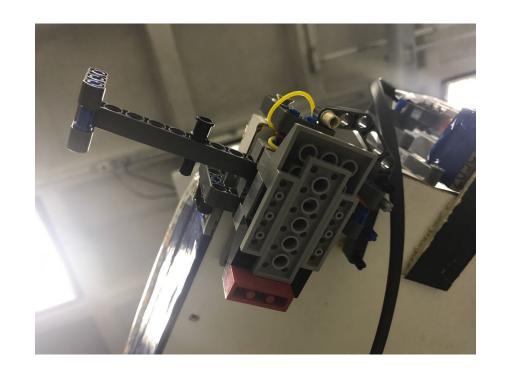


# Segunda versão



#### Mecanismos das aletas



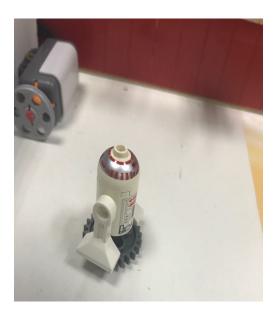


Inicial Final

# Motores

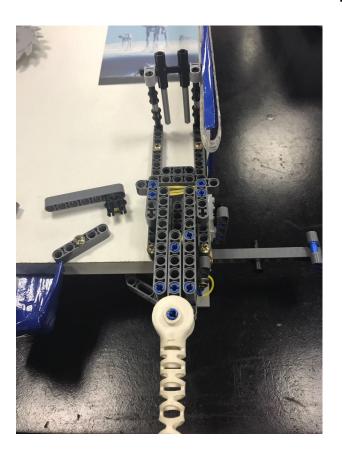


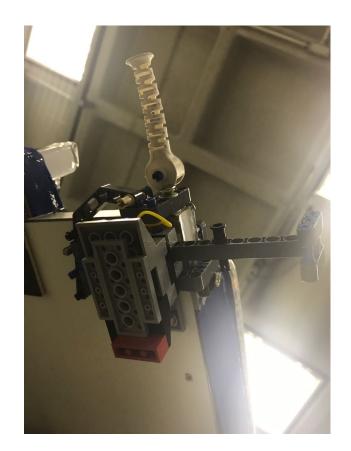




A B C

# Lançador





# Sensores de toque





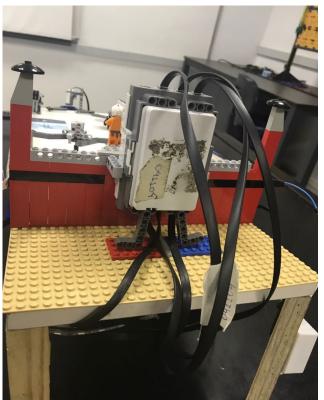
# Sensor de luz





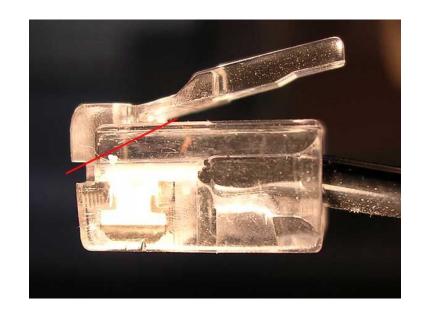
# **NXT**





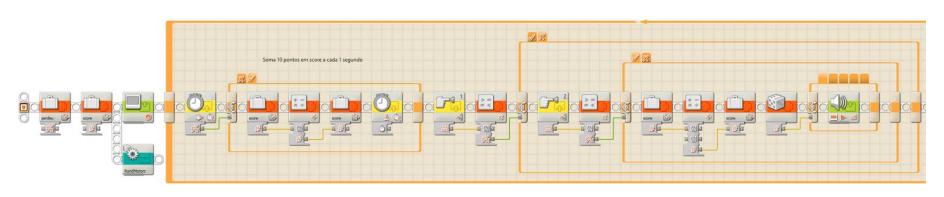
# Cabos

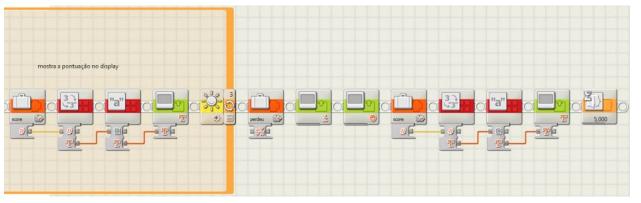




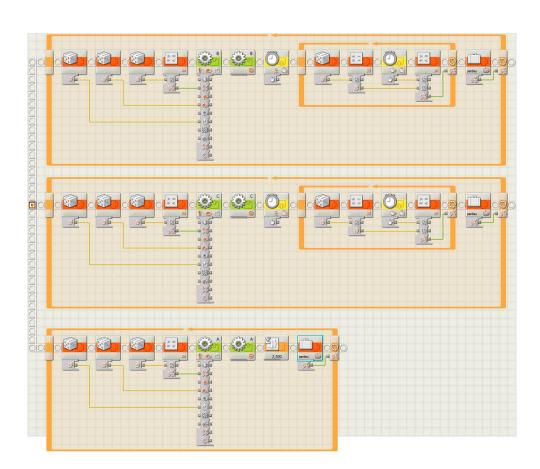
# Programação

# **MINDSTORMS**





# **MINDSTORMS**



#### MIT APP INVENTOR

```
0
initialize global
                   maior to
 initialize global
                              10
                    score to
                  .Initialize
      Screen1
            Player1 . Start
                      TimerEnabled v to
                                          false *
          Clock1 *
      ConnectNXT BeforePicking
          ConnectNXT
                           Elements *
                                              BluetoothClient1
                                                                  AddressesAndNames
                                        to
       ConnectNXT ... AfterPicking
                                     call
                                           BluetoothClient1 *
                                                             .Connect
     evaluate but ignore result
                                                              address
                                                                         ConnectNXT *
                                                                                          Selection *
            Notifier1 *
                       .ShowAlert
     call
                           notice
                                       connected
```

#### MIT APP INVENTOR

```
when Play Click
                  Text v to
                                " POINTS: "
        Textos *
                       Visible to false
        ConnectNXT
                Visible * to
        Play *
                                false
                                Visible v to
        HorizontalArrangement1 *
                                              false
        HorizontalArrangement5 *
                                Visible v to
                                               false
        NxtTouchSensor1 *
                           PressedEventEnabled * to
                                                      true *
        NxtTouchSensor2 *
                           PressedEventEnabled v to
                                                      true *
        NxtLightSensor1 *
                          AboveRangeEventEnabled v to
                                                       true
                  Visible to
                               true v
        Pontos *
                  FontSize v to
                                  70
                   Text v to
         Pontos *
                  TimerEnabled to
         Clock1 *
                                     true
         NxtDirectCommands1 .StartProgram
                                programName
                                               pinball v3.rxe
```

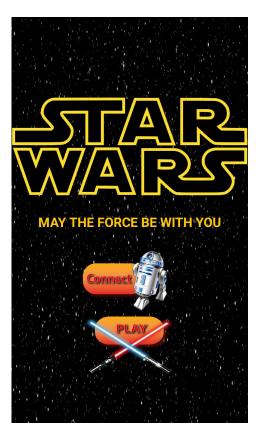
```
when Clock1 .Timer
do set global score to
                               get global score * +
                                                    10
    set Pontos v . Text v to
                                get global score
when NxtTouchSensor1 .Pressed
    set global score to
                               get global score *
                                                    200
when NxtTouchSensor2 Pressed
    set global score to
                              get global score v
                                                   100
when NxtLightSensor1 AboveRange
                  Text to
                                Do or Do Not. There's no Try
        Textos *
                  TimerEnabled to
                                     false
        Clock1 *
        NxtTouchSensor1 *
                           PressedEventEnabled v to
                                                      false *
        NxtTouchSensor2 *
                           PressedEventEnabled to
                                                      false *
         TinyWebDB1 .GetValue
                                   high value
                             tag
        Pontos *
                   FontSize v to
                                            Your Score:
        Pontos *
                   Text to
                                ioin
                                          get global score
        Button1 *
                   Visible v to
                                  true *
        HorizontalArrangement1 *
                                Visible to
                                              true *
        HorizontalArrangement4 *
                                Visible to
                                              true *
        HighScore *
                     Visible v to
                                    true
        HighScore2 *
                      Visible v to
                                     true
```

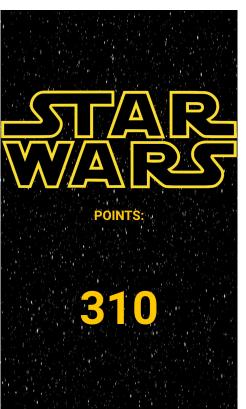
#### MIT APP INVENTOR

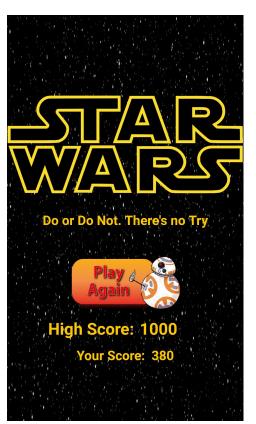
```
when TinyWebDB1 GotValue
                 valueFromWebDB
 tagFromWebDB
    get valueFromWebDB •
                get global score *
                                  21
          set global major to
                                 get global score *
    then
                TinyWebDB1 .StoreValue
                                               high_value
                                       tag
                              valueToStore
                                             get global maior *
               HighScore2 *
                              Text *
                                      to
                                            get global maior
                                 get valueFromWebDB *
    else
          set global maior to
               HighScore2 *
                              Text to
                                            get global maior *
```

```
Button1 Click
                               MAY THE FORCE BE WITH YOU
    Textos *
               Text *
                       to
    Button1 *
                Visible *
                               false
    HighScore
                  Visible *
                                  false
    HighScore2 *
                   Visible *
                                  false
               Visible v to
                              false *
    Pontos *
    NxtLightSensor1 *
                       AboveRangeEventEnabled to
                                                     false
    ConnectNXT *
                    Visible *
                             to
                                   true *
             Visible *
    Play *
                            true
                       to
    HorizontalArrangement5 *
                             Visible to
                                          true *
   global maior v to 0
set global score to
```

#### **DESIGN**







# SENSOR DE TOQUE



# **VERSÃO FINAL**





