



Electric Circuits

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[Notes](#)

[Project Poster](#)

Notes

懒得整了, 实在没有动力呢。 ;)

Project Poster

See below.

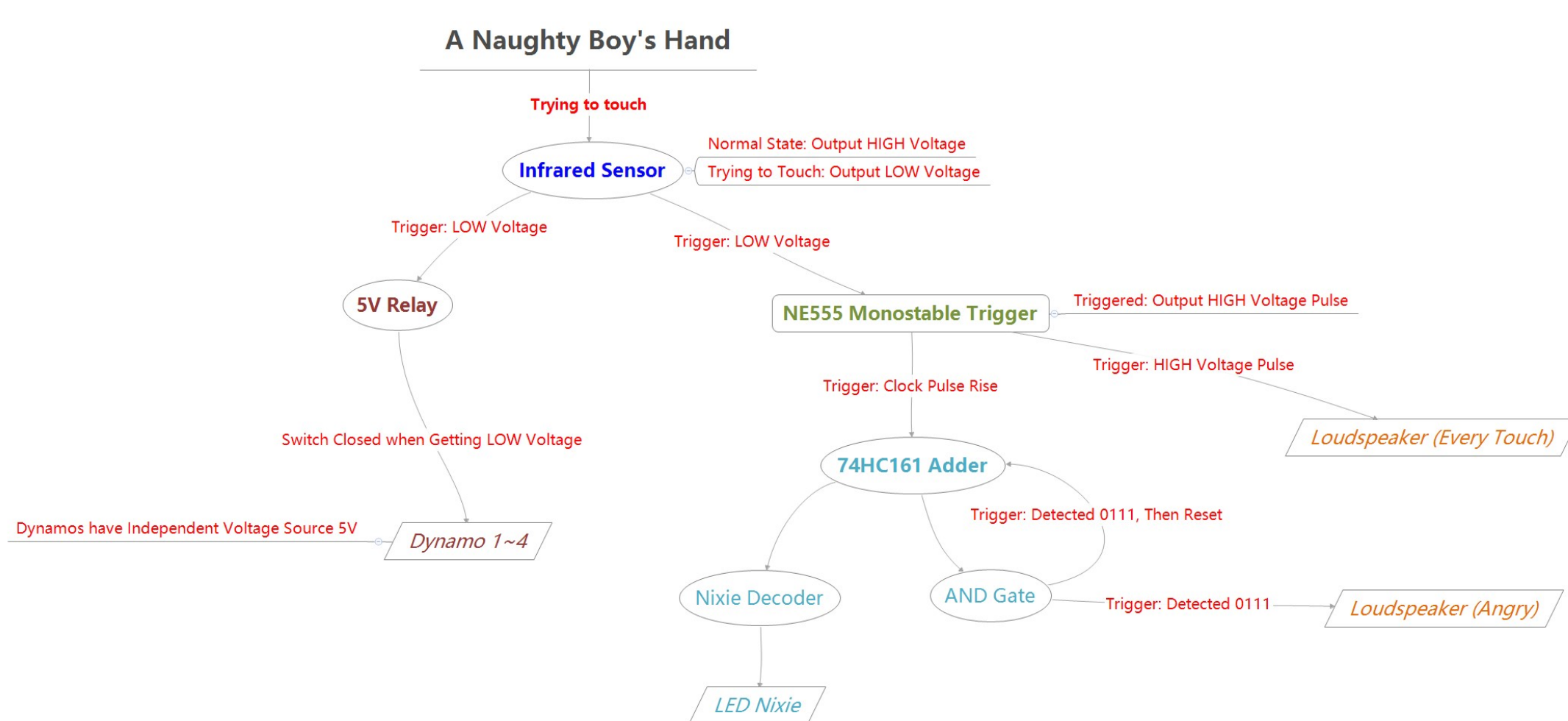
EE111 Project - "DON'T TOUCH ME" ROBOT

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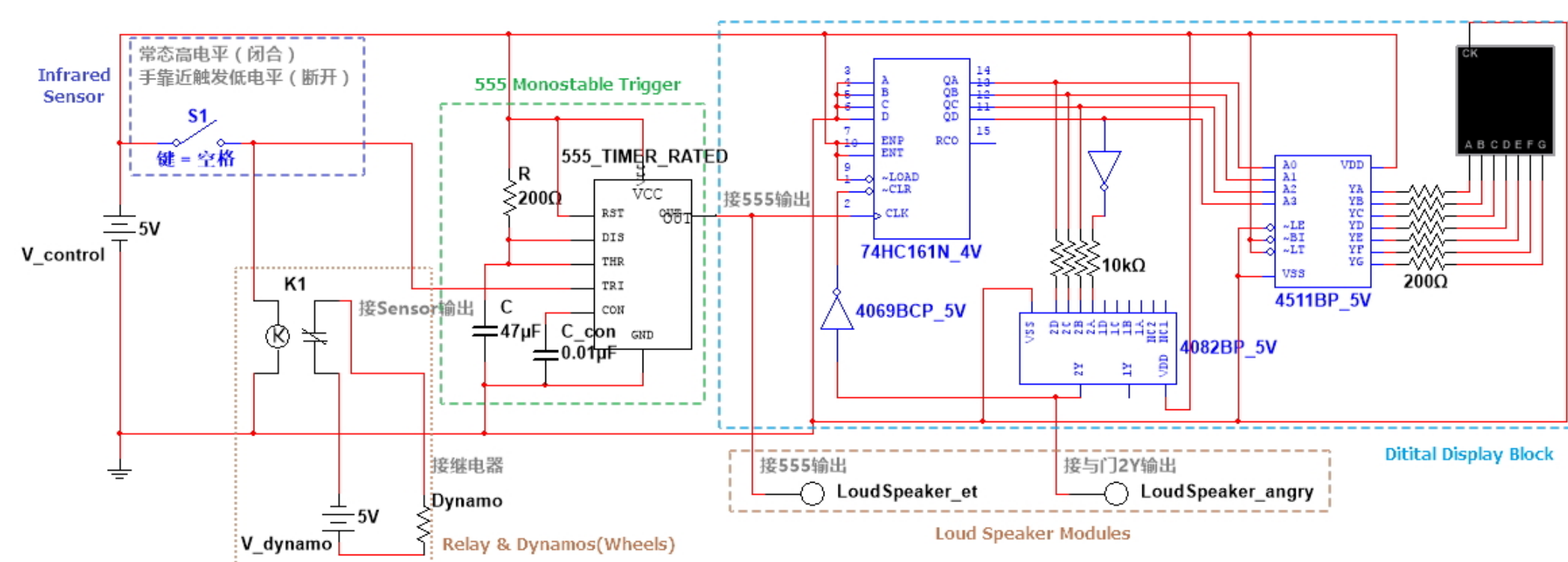
1. Design Requirements

- When touched (or approached), the robot yields a "Don't Touch Me" signal, and runs back away.
- The robot counts the number of times being touched, and display it with Digital tube.
- The robot gets angry when the number hits a threshold value. Behavior of "getting angry" can be defined by yourself.
- You may not need to use any microcontrollers and should try to build with basic components.

2. Circuit Schematic



3. Simulation Diagram



Descriptions:

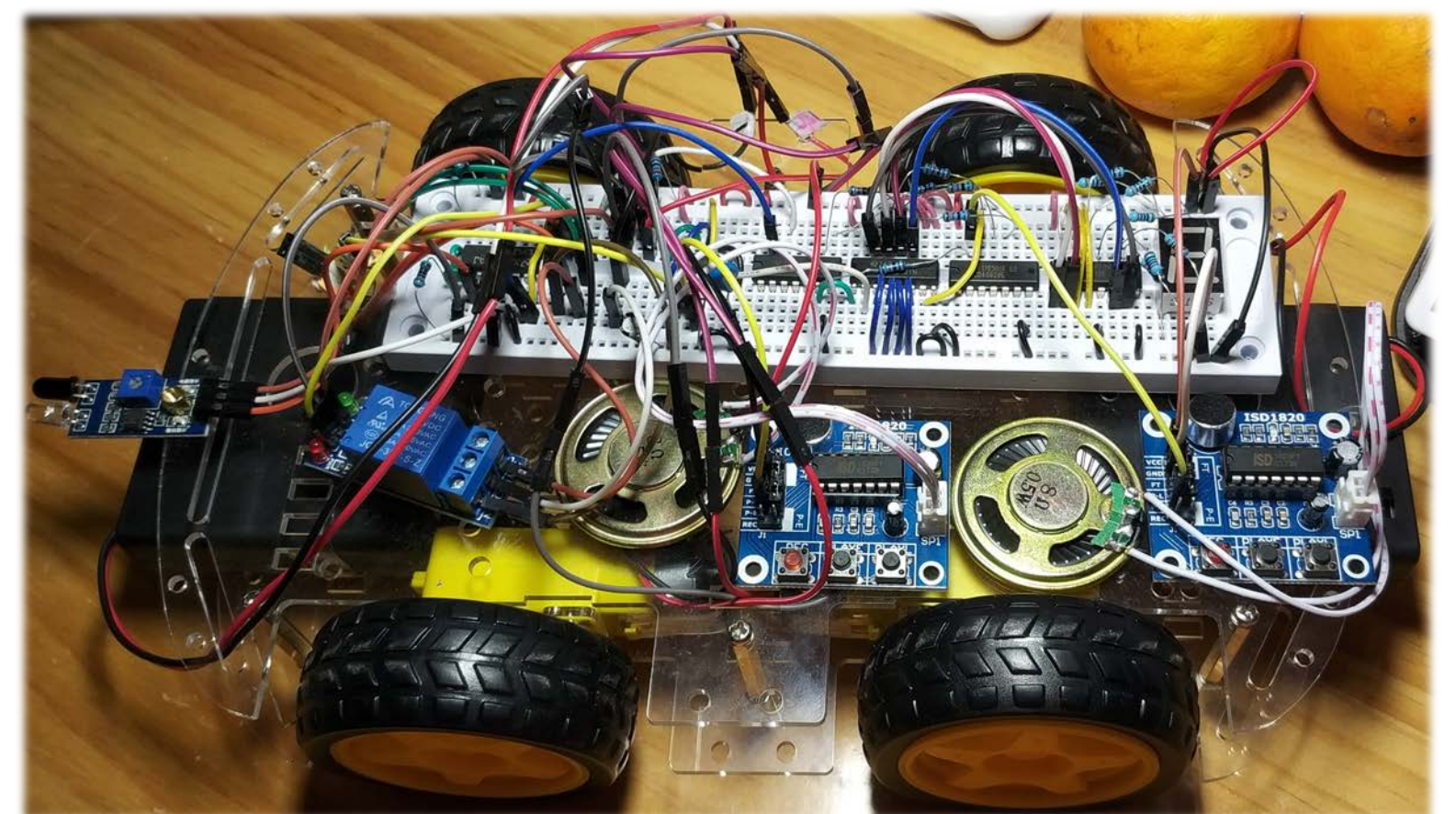
Every time the hand tries to touch the robot, the *Infrared Sensor* outputs LOW Voltage. As long as the hand is still too close to the robot, the *5V Relay* is triggered and wheels spin backwards to avoid touching. Also, every touch triggers the *555 Monostable Trigger* once, outputs a HIGH (Clock Rising) pulse signal, which makes *Loudspeaker1* shout and *74HC161 Adder* increases by one.

If "6" touches are recorded, the next touch will produce 0111

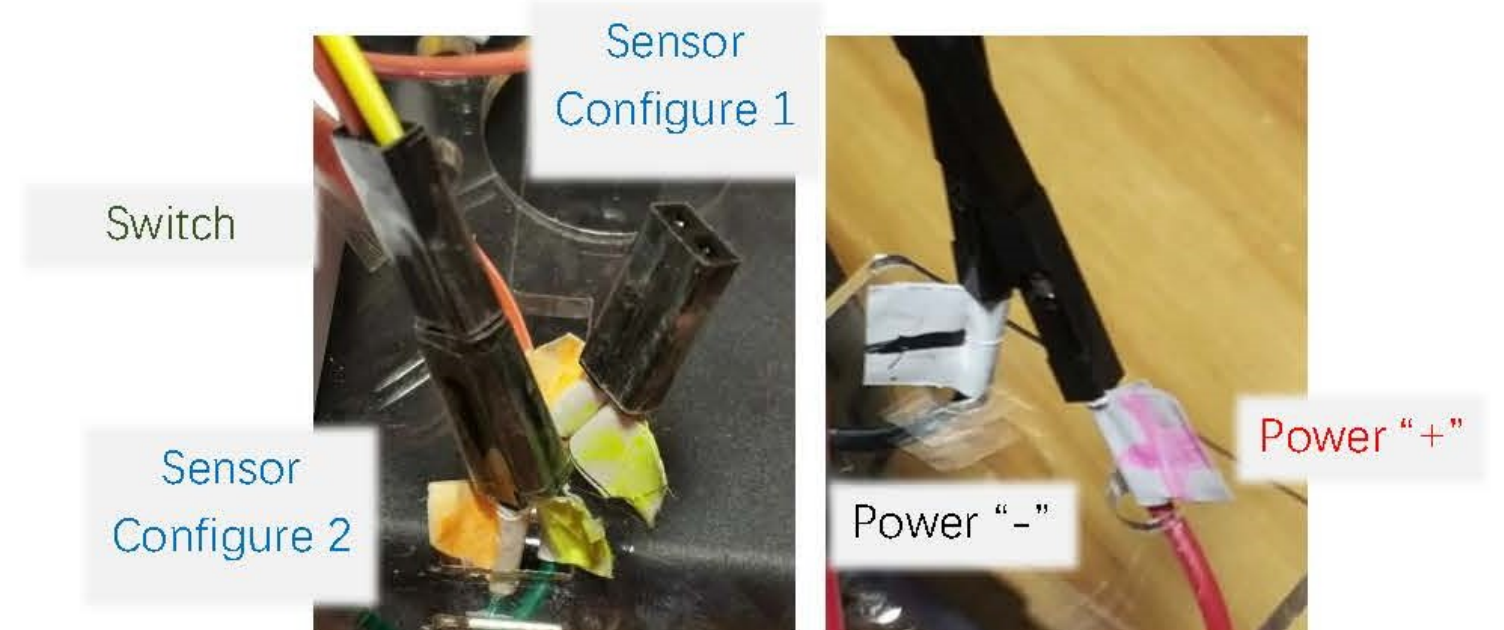
(i.e. 7 in decimal) on Adder output, then by the *AND Gate* it triggers *Loudspeaker2* to shout an "angry" sound and resets the Adder.

4. Implementation (with Bonus)

Robot Overview



Control Ports



➤ "Don't Touch Me – Robot" Mode

Switch → Sensor Configure 1, V_{dynamo} → Normally connected

The original mode, avoids your touch.

➤ "Please Touch Me – Robot" Mode

Switch → Sensor Configure 2, V_{dynamo} → Oppositely connected

As you move your hand back, the robot will try to get close, acting like it is eager for your touch.

➤ "Come & Chase – Robot" Mode

Switch → Sensor Configure 2, V_{dynamo} → Normally connected

When you move your hand away, the robot will run away from you, and you must try to chase it and put your hand close to the robot again.

List of Components

Component Name	Amounts	Component Name	Amounts
Car Suite	1	CD4082 (AND Gate)	1
5V Dynamo	4	CD4511 (Decoder)	1
Battery Box (with Switch)	2	Nixie LED (1 digit)	1
1.5V Battery	8	Loudspeaker Module	2
5V LOW-Trigger Relay	1	Resistor - 10kΩ	4
Infrared Sensor Module	1	Resistor - 200Ω	8
NE555	1	Capacitor - 0.01μF	1
74HC161 (Adder)	1	Capacitor - 47μF	1
CD4069 (NOT Gate)	1	Dupont & Jump Wires	∞

