1. Introduction

The most common robot gripper is as in this picture. Two flat often metal sheets pressing down on the tool it try to grab. No information on the shape, texture or features. In this work an attempt to create an sensor that could give robots an way to 'feel'

2. Conductive foam.

What is What is High Density Conductive Polyethylene Black Foam you might wonder. That foam is the foam you use to protect the Integrated circuits from static electricity.

3. How it works

How this works on a high abstraction is do tho three properties of the material. Firstly the material have a given resistance per meter. Secondly the material have empty holes. Third. Because the material is a foam the material could be squeezed thus short circuit the material the resistance is changing.

4. What was done

The approach to measure this is based an grid array of measurement pins inserted in to the bottom of the foam.

That grid of measurement pins in the foam could be abstracted down to a resistor map as shown. In the implementation as shown later the pins in this map will be altering from positive to negative. And by the implemented algorithm a image of the features in the pressed down figure could be shown.

5. How the measurements was done.

An Arduino was used for this project to measure the foam. In this figure an high abstraction electrical flow chart is presented. Two muxes is used to switch the measurements from pair to pair. Observe that the resitor with the variable resistance in the foam acts as an part of a voltage divider. Read by the **Vread** input to the Arduino.

6. How the algorithm works

To generate an matrix from the measurements the following algorithm visualised here are proposed. On the left the abstracted resistor grid representing the foam and on the right an outline of an matrix is shown. In this demo the matrix wont be filled with values. Instead the focus is to show how the values are acquired.

6.1. Measurements

0   The first measurement is done by taking the two highlighted resistors

1   Second measurement

2   , Third measurement

3   Last measurement

7. Hardware implementation.

The hardware that was intended to be implemented in this project have tree parts.

1   On the left an standard Arduino

2   In the middle the board with the multiplexers are shown.

3   This construction is used to so that standard lab cables could be used for measurements.

8. Results.

Do to project complexity, time and unforeseen problems like the Voltera accuracy smears out the traces and don't support Linux. What we did instead. Proof of concept measurements of the foam resistance drop when exposed to pressure. Result from program with dummy text string as input is shown on the next slide. This corresponds somewhat to Proof of concept measurements. We still intent to complete

the project do to personal interest.