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Massey University

SCHOOL OF ENGINEERING AND
ADVANCED TECHNOLOGY

**Design and Development of a Food Texture
Analyser**

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Abstract

Texture is an important attribute of food and is one of the several dimensions of food quality. In today's world of sensing and automated measurements, it is becoming increasingly common to analyse food by using a texture analyser. A variety of texture analysers is in use by researchers and industry for the purpose of quality assurance and improvements.

This thesis is on the design, development and implementation of a food texture analyser with a focus on enhancing response time, increasing measurement flexibility, and reducing equipment cost.

Several enhancements have been done to an existing texture analyser. A high-end 24-bits ADC (Analogue to Digital Converter) has been used to measure the output of a load cell very accurately. The output of the ADC is coupled to a modern microcontroller using the industry standard SPI bus. A touch screen has been incorporated to provide an easy user interface. A completely new motor controller/driver has been employed for the movement of the robotic arm and an infra-red sensor has been used to detect its position. A unique and novel contribution is in the form of a new command-language that has been developed which makes it extremely flexible for the user to control the motor movements. An enhancement, not found in existing commercial texture analysers, is the real-time graphing of measurement data which is displayed on the PC. Additionally all the data can be saved to a text file or a CSV file for subsequent retrieval and processing.

The complete system has been realised and tested. Several different fruits were used for experiments and the measurement data compared with a commercial texture analyser. The system is simple to use, versatile and low cost for use in research and industry.

Table of Contents

ACKNOWLEDGEMENTS	i
Abstract.....	ii
Chapter 1 Introduction.....	6
1.1 What is a fruit texture measurement system?	11
Chapter 2 Review of Texture Analysers	13
2.1 Introduction to Texture Analyser	13
2.2 Limitations of existing Texture Analysers	16
2.3 Specifications	18
2.4 Summary	19
Chapter 3 Mechanical Design	21
3.1 Methods for movement	22
3.2 Mechanical Component Description	23
3.2.1 Material selection.....	23
3.2.2 Ball screw.....	25
3.2.2 Stepper motor	28
3.2.4 Base of the instrument.....	30
3.2.2 Infra-red sensor holder	32
3.2.3 Load cell.....	32
3.3 Summary	34
Chapter 4 Electronic design.....	35
4.1 Electronic design and overview.....	35
4.2 Master board	38
4.2.1 Microcontroller	38

4.2.2 Stepper Motor Driver.....	40
4.2.3 ADC.....	44
4.2.4 Pull-up Resistor.....	50
4.2.5 Infra-Red sensor	51
4.2.6 Using diode to realise an OR Gate	52
4.2.7 Power supply	52
4.3 Slave Board	58
4.3.1 Touchscreen	58
4.4 Protection System and Circuits.....	61
4.5 Schematic and PCB	61
4.6 Summary	67
Chapter 5 Software Implementation.....	68
5.1 SPI Bus:.....	68
5.2 Microcontroller programming	69
5.2.1 Stepper Motor Driver.....	69
5.2.2 Analogue to Digital Converter.....	72
5.2.3 Touch Screen.....	74
5.2.4 Control Modes and the Interpreter	75
5.3 Graphical User Interface for Instrument Control.....	81
5.3.1 Functions and Features of the Graphical User Interface.....	81
5.3.2 Serial Port.....	83
5.4 Summary	84
Chapter 6 Experiments and Results.....	85
6.1 Initial force test using pressure ball.....	85
6.2 Repeat tests and comparison.....	88
6.3 Experimentations with fruits.....	89
6.3.1 Avocado	89
6.3.2 Kiwifruit	93

6.3.2 Persimmon.....	97
6.4 Summary	102
Chapter 7 Summary and Future Possibilities	103
References	106
Appendix.....	109
Appendix 1: Critical Component Data Sheets.....	109
Appendix 2: PCB design.....	116
Appendix 3: Test results	118
Appendix4: ADC code	136

List of Figures

Chapter 1

FIGURE 1.1: PUNCTURE FORCE VS PUNCH AREA (REPRINTED FROM J.FOOD SCI.31, 286, 1966; COPYRIGHT BY INSTITUTE OF FOOD TECHNOLOGIST.).....	8
FIGURE 1.2: FOOD TEXTURE AND VISCOSITY: CONCEPT AND MEASUREMENT: ACADEMIC PRESS FROM BOURNE, M. (2002).....	11
FIGURE 1.3: SIMPLE DIAGRAM OF THE WHOLE SYSTEM.....	12

Chapter 2

FIGURE 2.1: POWDER FLOW ANALYSER [18]	13
FIGURE 2.2: TA.XT PLUS TEXTURE ANALYSER [18]	14

Chapter 3

FIGURE 3.1: TEXTURE ANALYSER	21
FIGURE 3.2: THE MODIFIED TEXTURE ANALYSER	23
FIGURE 3.3: DIMENSIONS OF THE IEC CONNECTOR	30
FIGURE 3.4: DIMENSIONS OF DB9	31
FIGURE 3.5: DIMENSIONS OF DB15	31
FIGURE 3.6: THE BASE IN SOLIDWORKS.....	31
FIGURE 3.7: SOLIDWORKS DESIGN OF THE INFRA-RED SENSOR HOLDER	32
FIGURE 3. 8: LOAD CELL.....	33
FIGURE 3.9: THE PRINCIPLE OF THE LOAD CELL WORKING [36]	33
FIGURE 3.10: THE SPECIFICATIONS OF THE LOAD CELL	34

Chapter 4

FIGURE 4.1: FUNCTIONAL BLOCK DIAGRAM OF THE ELECTRONIC DESIGN	36
FIGURE 4.2: THE SIZE OF EXECUTABLE FILE OF MASTER BOARD	37
FIGURE 4.3: THE SIZE OF EXECUTABLE FILE OF SLAVE BOARD.....	37
FIGURE 4.4: ARDUINO NANO [40]	39
FIGURE 4.5: L6472 MICROSTEPPING MOTOR DRIVES[42]	41
FIGURE 4.6: TYPICAL CIRCUIT OF L6472	42
FIGURE 4.7: THE CHARGE PUMP CIRCUIT [42]	43
FIGURE 4.8: THE SCHEMATIC OF L6472	44
FIGURE 4.9: THE INTERNAL STRUCTURE OF THE ADC	45
FIGURE 4.10: TYPICAL CIRCUIT OF THE ADC 7192[45]	48
FIGURE 4.11: THE SCHEMATIC OF ADC 7192 CIRCUIT	49
FIGURE 4.12: EXAMPLE CODE OF ADC 7192.....	49
FIGURE 4.13: THE RESULT FROM ADC	50
FIGURE 4.14: THE SCHEMATIC OF PULL UP RESISTORS	51
FIGURE 4.15: INFRA-RED SENSOR.....	52
FIGURE 4.16: THE SCHEMATIC OF OR GATE.....	52
FIGURE 4.17: THE TYPICAL CIRCUIT OF LM2594.....	53

FIGURE 4.18: THE SCHEMATIC OF LM2594.....	53
FIGURE 4.19: THE RIPPLE BEFORE LC FILTER.....	54
FIGURE 4.20: THE RIPPLE AFTER LC FILTER	54
FIGURE 4.21: TYPICAL CIRCUIT FOR 7805.....	55
FIGURE 4.22: THE POWER-SUPPLY REJECTION RATIO (TPSA4901) [53].....	55
FIGURE 4.23: THE SCHEMATIC OF TPSA4901 [53]	56
FIGURE 4.24: THE RIPPLE AFTER LDO FILTER	56
FIGURE 4.25: THE SCHEMATIC OF REF5050.....	57
FIGURE 4.26: THE SCHEMATIC OF THE POWER SUPPLY.....	57
FIGURE 4.27: TOUCH SCREEN	58
FIGURE 4.28: THE PRINCIPLE OF TOUCH SCREEN OPERATION [56].....	59
FIGURE 4.29: 4 WIRE TOUCH SCREEN.....	60
FIGURE 4.30: PROTECT SYSTEM.....	61
FIGURE 4.31: THE SCHEMATIC OF THE PROTECTION SYSTEM [57].....	61
FIGURE 4.32: THE FORMATTING OF MIXED SIGNAL [63].....	63
FIGURE 4.33: THE DIAGRAM OF MIXED SIGNAL [63]	63
FIGURE 4.34: THE COMPLETE SCHEMATIC OF THE MASTER BOARD [63].....	65
FIGURE 4.35: THE SCHEMATIC OF THE SLAVE BOARD	65
FIGURE 4.36: TOP LAYER OF THE MASTER BOARD	66
FIGURE 4.37: BOTTOM LAYER OF THE MASTER BOARD	66
FIGURE 4.38: THE PCB DESIGN OF THE SLAVE BOARD	67

Chapter 5

FIGURE 5.1: SPI BUS CONNECTIONS BETWEEN MASTER AND SLAVE DEVICES	68
FIGURE 5.2: SPI TIMING DIAGRAM OF L6472 STEPPER MOTOR DRIVER CHIP	69
FIGURE 5.3: CONTINUOUS CONVERSION MODE	72
FIGURE 5.4: CONTINUOUS READ	73
FIGURE 5.5: THE VISUAL BUTTONS OF THE TOUCH SCREEN.....	75
FIGURE 5.6:PROGRAM CONTROL MODE STRUCTURE.....	78
FIGURE 5.7: AN EXAMPLE OF RECURSIVE CODE IN C.....	80
FIGURE 5.8: THE STRUCTURE OF THE SOFTWARE DESIGN.....	80
FIGURE 5.9 : SNIPPET OF CODE TO PARSE THE COMMAND STRING AT THE MICROCONTROLLER END.....	81
FIGURE 5.10: CODE TO SEND COMMAND STRING ON RS232 PORT.....	81
FIGURE 5.11: THE GRAPHICAL USER INTERFACE (GUI) FOR THE INSTRUMENT.....	82
FIGURE 5.12 REAL TIME MEASUREMENT DATA AND GRAPH	82
FIGURE 5.13 THE TEXTBOX FOR DISPLAYING THE DATA FROM THE LOAD CELL	82
FIGURE 5.14 SAMPLE CODE OF SERIAL PORT INITIALIZATION	83

Chapter 6

FIGURE 6.1: SQUEEZE/BOUNCY BALL USED FOR INITIAL EXPERIMENTATION	86
FIGURE 6.2: THE COMPRESSION PROBE USED WITH THE SQUEEZE BALL.....	86
FIGURE 6.3: THE RESULT FROM TESTS DONE USING STANDARD TEXTURE ANALYSER (FORCE VS. TIME)	

.....	86
FIGURE 6.4: THE RESULT FROM TESTS DONE USING THE NEWLY DEVELOPED TEXTURE ANALYSER	87
FIGURE 6.5: COINCIDING THE TEST CURVES.....	88
FIGURE 6.6: TESTING AVOCADO USING STANDARD TEXTURE ANALYSER.....	89
FIGURE 6.7: TESTING AVOCADO USING THE NEW TEXTURE ANALYSER	90
FIGURE 6.8: RESULTS OF FORCE MEASUREMENT OF AVOCADO USING THE STANDARD TEXTURE ANALYSER	90
FIGURE 6.9: RESULTS OF FORCE MEASUREMENT OF AVOCADO USING THE NEW TEXTURE ANALYSER	91
FIGURE 6.10: COMBINING THE RESULTS OF THE TEXTURE ANALYSER AND THE NEW INSTRUMENT FOR AVOCADO	91
FIGURE 6.11: TESTING KIWIFRUIT USING STANDARD TEXTURE ANALYSER	94
FIGURE 6.12: TESTING KIWIFRUIT USING THE NEW ANALYSER.....	94
FIGURE 6.13: RESULTS OF FORCE MEASUREMENT OF KIWIFRUIT USING THE STANDARD TEXTURE ANALYSER	94
FIGURE 6.14: RESULTS OF FORCE MEASUREMENT OF KIWIFRUIT USING THE NEW TEXTURE ANALYSER	95
FIGURE 6.15: COMBINING THE RESULTS OF THE TEXTURE ANALYSER AND THE NEW INSTRUMENT FOR KIWIFRUIT	95
FIGURE 6.16: PERSIMMON BEING TESTED USING A STANDARD TEXTURE ANALYSER.....	98
FIGURE 6.17: RESULTS OF FORCE MEASUREMENT OF PERSIMMON USING THE STANDARD TEXTURE ANALYSER	98
FIGURE 6.18: RESULTS OF FORCE MEASUREMENT OF PERSIMMON USING THE NEW TEXTURE ANALYSER	98
FIGURE 6.19: COMBINING THE RESULTS OF THE TEXTURE ANALYSER AND THE NEW INSTRUMENT FOR PERSIMMON.....	99

List of Tables

Chapter 1

TABLE 1.1: THE PUNCTURE FORCE FOR SAMPLE NUT (FROM BOURNE, M. (2002). FOOD TEXTURE AND VISCOSITY: CONCEPT AND MEASUREMENT: ACADEMIC PRESS.	8
TABLE 1.2: THE EXAMPLES OF ROME APPLES WHEN SQUEEZED. FROM BOURNE, M. (2002). FOOD TEXTURE AND VISCOSITY: CONCEPT AND MEASUREMENT: ACADEMIC PRESS [13]	10

Chapter 2

TABLE 2.1: BASIC PARAMETERS OF TA.XT PLUS	15
TABLE 2.2: TECHNICAL SPECIFICATIONS OF TA.HD PLUS	16
TABLE 2.3: THE SPEED OF ORIGINAL TEXTURE ANALYSER	17
TABLE 2.4: THE SPEED OF NEW TEXTURE ANALYSER	17
TABLE 2.5: AVERAGE FORCE PER TOOTH DURING MASTICATION[13]	19

Chapter 4

TABLE 4.1: SPECIFICATIONS OF NANO	39
TABLE 4.2: COMMUNICATIONS REGISTER OF ADC 7192	47
TABLE 4.3: MODE REGISTER OF ADC 7192.....	47
TABLE 4.4: CONFIGURATION REGISTER OF ADC 7192.....	48

Chapter 5

TABLE 5.1: THE REGISTERS OF L6472	70
TABLE 5.2: COMMAND SET OF L6472	71
TABLE 5.3: PROGRAMMING THE CHANNEL SELECTION BITS FOR THE ADC.....	74
TABLE 5.4: SETTING THE GAIN FOR THE ADC.....	74
TABLE 5.5: POLARITY SELECT BIT.....	74

Chapter 6

TABLE 6.1: THE CONDITIONS OF THE PRESSURE BALL TEST	85
TABLE 6.2: THE MAXIMUM, MINIMUM, MEAN ERROR AND STANDARD DEVIATION FOR MEASUREMENTS DONE ON SQUEEZE BALL WITH THE STANDARD AND THE NEW INSTRUMENT	87
TABLE 6.3: THE CONDITIONS OF THE AVOCADO TEST	89
TABLE 6.4: THE MAXIMUM, MINIMUM, MEAN ERROR AND STANDARD DEVIATION FOR MEASUREMENTS DONE ON AVOCADO WITH THE STANDARD AND THE NEW INSTRUMENT	92
TABLE 6.5: THE CONDITIONS OF TESTING KIWIFRUIT.....	93
TABLE 6.6: THE MAXIMUM, MINIMUM, MEAN ERROR AND STANDARD DEVIATION FOR MEASUREMENTS DONE ON KIWIFRUIT WITH THE STANDARD AND THE NEW INSTRUMENT.....	95
TABLE 6.7: THE CONDITIONS OF TESTING PERSIMMON.....	97
TABLE 6.8: THE MAXIMUM, MINIMUM, MEAN ERROR AND STANDARD DEVIATION FOR MEASUREMENTS DONE ON PERSIMMON WITH THE STANDARD AND THE NEW INSTRUMENT ...	99

Chapter 7

TABLE 7.1: COMPARISON BETWEEN TWO TEXTURE ANALYSERS.....	105
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