# SURVEY METHODOLOGY

# SURVEY METHODOLOGY
## This is the Subtitle

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Published by John Wiley & Sons, Inc., Hoboken, New Jersey.
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***Library of Congress Cataloging-in-Publication Data:***

Survey Methodology / Robert M. Groves . . . [et al.].
p. cm.—(Wiley series in survey methodology)
"Wiley-Interscience."
Includes bibliographical references and index.
ISBN 0-471-48348-6 (pbk.)
1. Surveys—Methodology. 2. Social sciences—Research—Statistical methods. I. Groves, Robert M. II. Series.

HA31.2.S873 2007
001.4'33—dc22 2004044064
Printed in the United States of America.

10 9 8 7 6 5 4 3 2 1

*To my parents*

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# CONTENTS IN BRIEF

# CONTENTS

# LIST OF FIGURES

# LIST OF TABLES

# FOREWORD

This is the foreword to the book.

# PREFACE

This is an example preface. This is an example preface. This is an example preface. This is an example preface.

R. K. WATTS

*Durham, North Carolina*
*September, 2007*

# ACKNOWLEDGMENTS

From Dr. Jay Young, consultant from Silver Spring, Maryland, I received the initial push to even consider writing this book. Jay was a constant “peer reader” and very welcome advisor durying this year-long process.

To all these wonderful people I owe a deep sense of gratitude especially now that this project has been completed.

G. T. S.

# ACRONYMS

| | |
|---|---|
| ACGIH | American Conference of Governmental Industrial Hygienists |
| AEC | Atomic Energy Commission |
| OSHA | Occupational Health and Safety Commission |
| SAMA | Scientific Apparatus Makers Association |


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# GLOSSARY

| | |
|---|---|
| NormGibbs | Draw a sample from a posterior distribution of data with an unknown mean and variance using Gibbs sampling. |
| pNull | Test a one sided hypothesis from a numberically specified posterior CDF or from a sample from the posterior |
| sintegral | A numerical integration using Simpson's rule |


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# SYMBOLS

$A$ Amplitude
& Propositional logic symbol
$a$ Filter Coefficient

$\mathcal{B}$ Number of Beats


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# INTRODUCTION

CATHERINE CLARK, PHD.

Harvard School of Public Health
Boston, MA, USA

The era of modern  began in 1958 with the invention of the integrated circuit by J. S. Kilby of Texas Instruments [1]. His first chip is shown in Fig. I. For comparison, Fig. I.2 shows a modern microprocessor chip, [4].

This is the introduction. This is the introduction. This is the introduction. This is the introduction. This is the introduction. This is the introduction.

$$ABCDEF\alpha\beta\Gamma\Delta\sum_{def}^{abc} \tag{I.1}$$

## REFERENCES

1. J. S. Kilby, "Invention of the Integrated Circuit," *IEEE Trans. Electron Devices,* **ED-23,** 648 (1976).
2. R. W. Hamming, *Numerical Methods for Scientists and Engineers*, Chapter N-1, McGraw-Hill, New York, 1962.
3. J. Lee, K. Mayaram, and C. Hu, "A Theoretical Study of Gate/Drain Offset in LDD MOSFETs" *IEEE Electron Device Lett.,* **EDL-7**(3). 152 (1986).

**PART I**

# SUBMICRON SEMICONDUCTOR MANUFACTURE

# CHAPTER 1

# THE SUBMICROMETER SILICON MOSFET

> The sheer volumne of answers can often stifle insight...The purpose of computing is insight, not numbers.
>
> —Hamming [2]

## 1.1 Here is a normal section

Here is some text.

### 1.1.1 This is the subsection

Here is some normal text. Here is some normal text. Here is some normal text. Here is some normal text. Here is some normal text. Here is some normal text. Here is some normal text. Here is some normal text. Here is some normal text. Here is some normal text.


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#### *1.1.1.1 This is the subsubsection*

Here is some text after the subsubsection. Here is some text after the subsubsection. Here is some text after the subsubsection. Here is some text after the subsubsection.

*This is the paragraph* Here is some normal text. Here is some normal text. Here is some normal text. Here is some normal text.

## 1.2 Tips On Special Section Heads

Here are some things you can do for a special section head.

## 1.3 Break Long Section heads with double backslash

Here is some normal text. Here is some normal text. Here is some normal text.

## 1.4 Here is a Section Title

See this section head for information on how to explicitly break lines in table of contents.

## 1.5 How to get lower case in section head: $pH$

Here is some normal text. Here is some normal text. Here is some normal text.

## 1.6 How to use a macro that has both upper and lower case parts: $V_{Txyz}$

See the top of this file where the definition and box were set.

## 1.7 Equation

For optimal vertical spacing, no blank lines before or after equations

$$\alpha\beta\Gamma\Delta \tag{1.1}$$

as you see here.

# CHAPTER 2

# FIRST EDITED BOOK SAMPLE CHAPTER TITLE

G. Alvarez and R. K. Watts

Carnegie Mellon University, Pittsburgh, Pennsylvania

## 2.1 Here is a normal section

Here is some text.

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# CHAPTER 3

# SECOND EDITED BOOK SAMPLE CHAPTER TITLE

GEORGE SMEAL, PH.D.[1], SALLY SMITH, M.D.[2] AND STANLEY KUBRICK[1]

[1]AT&T Bell Laboratories Murray Hill, New Jersey
[2]Harvard Medical School, Boston, Massachusetts

## 3.1 Sample Section

Here is some sample text.

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## 3.2 Example, Figure and Tables

**EXAMPLE 3.1 Optional Example Name**

Use Black's law [Equation (6.3)] to estimate the reduction in useful product life if a metal line is initially run at 55°C at a maximum line current density.

illustration here

**Figure 3.1** Short figure caption.

**Figure 3.2** Oscillograph for memory address access operations, showing 500 ps address access time and superimposed signals of address access in 1 kbit memory plane.

**Table 3.1** Small Table

| one | two | three | four |
|---|---|---|---|
| C | D | E | F |

**Table 3.2** Effects of the two types of $\alpha\beta \sum_B^A$ scaling proposed by Dennard and co-workers[a,b]

| Parameter | $\kappa$ Scaling | $\kappa$, $\lambda$ Scaling |
|---|---|---|
| Dimension | $\kappa^{-1}$ | $\lambda^{-1}$ |
| Voltage | $\kappa^{-1}$ | $\kappa^{-1}$ |
| Currant | $\kappa^{-1}$ | $\lambda/\kappa^2$ |
| Dopant Concentration | $\kappa$ | $\lambda^2/\kappa$ |

[a] Refs. 19 and 20.

[b] $\kappa, \lambda > 1$.

### 3.2.1 Side by Side Tables and Figures

Space for figure...

**Figure 3.3** This caption will go on the left side of the page. It is the initial caption of two side-by-side captions.

Space for second figure...

**Figure 3.4** This caption will go on the right side of the page. It is the second of two side-by-side captions.

The command `\sidebyside{}{}` works similarly for tables:

**Table 3.3** Table Caption

| one | two | three | four |
|---|---|---|---|
| a | little | sample | table |

**Table 3.4** Table Caption

| A | B | C | D |
|---|---|---|---|
| a | second little | sample | table |

When using `\sidebyside`, one must use the cross referencing command `\label{}` after and *outside* of `\caption{}`:

```
\begin{table}
\sidebyside{\caption{Table Caption}\label{tab1}
first table}
{\caption{Table Caption}\label{tab2} second table}
\end{table}
```

or,

```
\begin{figure}
\sidebyside{\vskip<dimen>\caption{fig caption}\label{fig1}}
{\vskip<dimen>\caption{fig caption}\label{fig2}}
\end{figure}
```

## 3.3 Algorithm

This is a sample algorithm.

**Algorithm 3.1**

**state_transition algorithm** {
for each neuron $j \in \{0, 1, \ldots, M-1\}$
{
calculate the weighted sum $S_j$ using Eq. (6);
if ($S_j > t_j$)
{turn ON neuron; $Y_1 = +1$}
else if ($S_j < t_j$)
{turn OFF neuron; $Y_1 = -1$}
else
{no change in neuron state; $y_j$ remains unchanged;}
}
}

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> This is a sample of extract or quotation. This is a sample of extract or quotation. This is a sample of extract or quotation.

1. This is the first item in the numbered list.
2. This is the second item in the numbered list. This is the second item in the numbered list. This is the second item in the numbered list.

- This is the first item in the itemized list.
- This is the first item in the itemized list. This is the first item in the itemized list. This is the first item in the itemized list.

  This is the first item in the itemized list.

  This is the first item in the itemized list. This is the first item in the itemized list. This is the first item in the itemized list.

## PROBLEMS

**3.1** For Hooker's data, Problem 1.2, use the Box and Cox and Atkinson procedures to determine a appropriate transformation of PRES in the regression of PRES on TEMP. find $\hat{\lambda}$, $\tilde{\lambda}$, the score test, and the added variable plot for the score. Summarize the results.

**3.2** The following data were collected in a study of the effect of dissolved sulfur on the surface tension of liquid copper (Baes and Killogg, 1953).

| $x$ = Weight % sulfur | $Y$ = Decrease in Surface Tension (dynes/cm), two Replicates | |
|---|---|---|
| 0. 034 | 301 | 316 |
| 0. 093 | 430 | 422 |
| 0. 30 | 593 | 586 |

a) Find the transformations of $X$ and $Y$ sot that in the transformed scale the regression is linear.

b) Assuming that $X$ is transformed to $\ln(X)$, which choice of $Y$ gives better results, $Y$ or $\ln(Y)$? (Sclove, 1972).

c) In the case of $\alpha_1$?

d) In the case of $\alpha_2$?

**3.3** Examine the Longley data, Problem 3.3, for applicability of assumptions of the linear model.

**3.4** In the case of $\Gamma_1$?

**3.5** In the case of $\Gamma_2$?

## EXERCISES

**3.1** For Hooker's data, Exercise 1.2, use the Box and Cox and Atkinson procedures to determine a appropriate transformation of PRES in the regression of PRES on

TEMP. find $\hat{\lambda}$, $\tilde{\lambda}$, the score test, and the added variable plot for the score. Summarize the results.

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a) Find the transformations of $X$ and $Y$ sot that in the transformed scale the regression is linear.

b) Assuming that $X$ is transformed to $\ln(X)$, which choice of $Y$ gives better results, $Y$ or $\ln(Y)$? (Sclove, 1972).

c) In the case of $\Delta_1$?

d) In the case of $\Delta_2$?

**3.3** Examine the Longley data, Problem 3.3, for applicability of assumptions of the linear model.

**3.4** In the case of $\Gamma_1$?

**3.5** In the case of $\Gamma_2$?

## 3.4 Summary

This is a summary of this chapter. Here are some references: [1], [4].

## CHAPTER 4

# PYTHON MULTITHREAD PROGRAMMING

Menjalankan beberapa *thread* mirip dengan menjalankan beberapa program yang berbeda secara bersamaan, namun dengan manfaat berikut :

- Beberapa *thread* dalam proses berbagi ruang data yang sama dengan benang induk dan karena dapat saling berbagi informasi atau berkomunikasi satu sama lain dengan lebih muda daripada jika prosesnya terpisah
- *thread* terkadang disebut proses ringan dan tidak membutuhkan banyak memori atas, mereka lebih murah daripada proses.

Sebuah *thread* memiliki permulaan, urutan eksekusi dan sebuah kesimpulan. Ini memiliki pointer perintah yang melacak dari mana dalam konteksnya saat ini berjalan.

- Hal ini dapat dilakukan sebelum pre-*empted* (*inturrepted*)
- Untuk sementara dapat ditunda sementara *thread* lainnya yang sedang berjalan ini disebut unggul.


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## 4.1 Memulai Thread Baru

Untuk melakukan *thread* lain, perlu memanggil metode berikut yang tersedia dimodul *thread* :

Thread.start _new _thread (function, args [, kwargs] )

Pemanggilan metode ini memungkinkan cara cepat dan tepat untuk membuat *thread* baru di linux dan window.

Pemanggilan metode segera kembali dan anak *thread* dimulai dan fungsi pemanggilan dengan daftar *args* telah berlalu. Saat fungsi kembali ujung *thread* akan berakhir.

Disini, *args* adalah tupel argumen. Gunakan tupel kosong untuk memanggil fungsi tanpa melewati argumen. *Kwargs* adalah kamus opsional argumen kata kunci.
Contoh :

```
#!/usr/bin/python

Import thread
Import time

# Define a function for the thread
Def print _time (threadNamw, delay):
        Count = 0
        While count ¡5:
        Time.sleep(delay)
        Count +=1
        Print " %s : %s " % (threadName, time.ctime(time.time()))

# Create two thread as follows
try:
thread.start _new _thread(print _time, ( "Thread-1 ", 2, ))
thread.start _new _thread(print _time, ( "Thread-2 ", 4,))
except:
  print "Error: unable to start thread "

while 1:
pass
```

Bila kode diatas dieksekusi, maka menghasilkan hasil sebagai berikut :

```
Thread-1 : Thu Jan 22 15:42:17 2009

Thread-1 : Thu Jan 22 15:42:19 2009

Thread-2 : Thu Jan 22 15:42:19 2009
```

```
Thread-1 : Thu Jan 22 15:42:21 2009

Thread-2 : Thu Jan 22 15:42:23 2009

Thread-1 : Thu Jan 22 15:42:23 2009

Thread-1 : Thu Jan 22 15:42:23 2009

Thread-1 : Thu Jan 22 15:42:25 2009

Thread-2 : Thu Jan 22 15:42:27 2009

Thread-2 : Thu Jan 22 15:42:31 2009

Thread-2 : Thu Jan 22 15:42:35 2009
```

Meskipun sangat efektif untuk benang tingkat rendah, namun modul *thread* sangat terbatas dibandingkan dengan modul yang baru.

## 4.2 Modul Threading

Modul threading yang lebih baru disertakan dengan Python 2.4 memberikan jauh lebih kuat, dukungan tingkat tinggi untuk *thread* dari modul *thread* dibahas pada bagian sebelumnya.

The *threading* modul mengekpos semua metode dari *thread* dan menyediakan beberapa metode tambahan :

- **threading.activeCount()**

  Mengembalikan jumlah objek *thread* yang aktif

- **threading.currentThread()**

  Mengembalikan jumlah objek *thread* dalam kontrol benang pemanggil

- **threading.enumerate()**

  Mengembalikan daftar semua benda *thread* yang sedang aktif

  Selain metode, modul *threading* memiliki *thread* kelas yang mengimplementasikan *threading.* Metode yang disediakan oleh *thread* kelas adalah sebagai berikut :

- **run()**

Metode adalah titik masuk untuk *thread*

- **start()**

  Metode dimulai *thread* dengan memanggil metode run

- **join([time])**

  Menunggu benang untuk mengakhiri

- **isAlive()**

  Metode memeriksa apakah *thread* masih mengeksekusi

- **getName()**

  Metode mengambalikan nama *thread*

- **setName()**

  Metode menetapkan nama *thread*

## 4.3 Membuat Thread Menggunakan Threading Modul

Untuk melaksanakan *thread* baru menggunakan *threading* harus melakukan hal berikut :

**M**endefinisikan subclass dari *thread* kelas

Menimpa _init _ (self [args]) metode untuk menambahkan argumen tambahan

Menimpa run(self[args]) metode untuk menerapkan apa *thread* harus dilakukan ketika mulai

Setelah membuat baru *thread* subclass, dapat membuah seuah instance dari itu dan kemudian memulai *thread* baru dengan menerapkan *start(),* yang ada gilirinnya panggilan *run()* metode.

Contoh :

```
#!/usr/bin/python

import threading
import time

exitFlag = 0

class myThread (threading.Thread):
        def _init _(self, threadID, name, counter) :
    threading.Thread. _init _(self)
        self.threadID = threadID
        self.name = name
```

```
    self.counter = counter
def run (self) :
            print "Starting " + self.name
            print _time(self.name, self.counter, 5)
            print "Exiting "+ self.name

def print _time(threadName, delay, counter):
while counter:
            if exitFlag:
                        threadName.exit()
            time.sleep(delay)
            print " %s: %s " % (threadName, time.ctime(time.time()))
counter -= 1

# Create new threads
thread1 = myThread(1, "Thread-1 ", 1)
thread2 = myThread(2, "Thread-2 ", 2)

# Start new threads
thread1.start()
thread2.start()
print "Exiting Main Thread "
```

Ketika kode diatas dijalankan, menghasilkan hasil sebagai berikut:

```
Starting Thread-1
Starting Thread-2
Exiting Main Thread
Thread-1 : Thu Mar 21 09:10:03 2013
Thread-1 : Thu Mar 21 09:10:04 2013
Thread-2 : Thu Mar 21 09:10:04 2013
Thread-1 : Thu Mar 21 09:10:05 2013
Thread-2 : Thu Mar 21 09:10:06 2013
Thread-1 : Thu Mar 21 09:10:07 2013
Exiting Thread-1
Thread-2 : Thu Mar 21 09:10:08 2013
Thread-2 : Thu Mar 21 09:10:10 2013
Thread-2 : Thu Mar 21 09:10:12 2013
Exiting Thread=2
```

## 4.4 Sinkronisasi Thread

T*hreading* modul disediakan dengan Python termasuk sederhana untuk menerapkan mekanisme bahwa memungkinkan untuk menyinkronkan *thread* penguncian.

Sebuah kunci baru dibuat dengan memanggil *lock()* metode yang mengembalikan kunci baru.

The *acquire (blocking)* metode objek kunci baru digunakan untuk memaksa *thread* untuk menjalankan serempak. Opsional *blocking* parameter memungkikan untuk mengontrol apakah *thread* menunggu untuk mendapatkan kunci.

Jika *blocking* diatur ke 0, *thread* segera kembali dengan nilai 0 jika kunci tidak dapat diperoleh dan dengan 1 jika kunci dikuisisi. Jika pemblokiran diatur ke 1, blok dan menunggu kunci yang akan dirilis.

The *release()* metode objek kunci baru digunakan untuk melepaskan kunci ketika tidak lagi diperlukan.

### 4.5 Multithreaded Antrian Prioritas

The queue modul memungkinkan untuk membuat objek antrian baru yang dapat menampung jumlah tertentu item. Ada metode berikut untuk mengontrol antrian :

- **get()**

  Menghapus dan mengembalikan item dari antrian

- **put()**

  Menambahkan item ke antrian

- **qsize()**

  Mengembalikan jumlah item yang saat ini dalam antrian

- **empty()**

  Mengembalikan benar jika antrian kosong jika tidak, salah

- **full()**

Mengembalikan benar jika antrian penuh jika tidak, salah

## REFERENCES

1. J. S. Kilby, “Invention of the Integrated Circuit,” *IEEE Trans. Electron Devices,* **ED-23,** 648 (1976).
2. R. W. Hamming, *Numerical Methods for Scientists and Engineers*, Chapter N-1, McGraw-Hill, New York, 1962.
3. J. Lee, K. Mayaram, and C. Hu, “A Theoretical Study of Gate/Drain Offset in LDD MOSFETs” *IEEE Electron Device Lett.,* **EDL-7**(3). 152 (1986).
4. A. Berenbaum, B. W. Colbry, D.R. Ditzel, R. D Freeman, and K.J. O’Connor, “A Pipelined 32b Microprocessor with 13 kb of Cache Memory,” it Int. Solid State Circuit Conf., Dig. Tech. Pap., p. 34 (1987).

## Appendix: This is the Chapter Appendix Title

This is an appendix with a title.

$$\alpha\beta\Gamma\Delta \tag{A.1}$$

**Figure 4-A.1** This is an appendix figure caption.

**Table 4-A.1** This is an appendix table caption

| Date | Event |
|---|---|
| 1867 | Maxwell speculated the existence of electromagnetic waves. |
| 1887 | Hertz showed the existence of electromagnetic waves. |
| 1890 | Branly developed technique for detecting radio waves. |
| 1896 | Marconi demonstrated wireless telegraph. |
| 1897 | Marconi patented wireless telegraph. |
| 1898 | Marconi awarded patent for tuned communication. |
| 1898 | Wireless telegraphic connection between England and France established. |

## Appendix

This is a Chapter Appendix without a title.

Here is a math test to show the difference between using Computer Modern math fonts and MathTimes math fonts. When MathTimes math fonts are used the letters in an equation will match TimesRoman italic in the text. (*g, i, y, x, P, F, n, f, etc.*) Caligraphic fonts, used for $\mathcal{ABC}$ below, will stay the same in either case.

$$g_i(y|f) = \sum_x P(x|F_n) f_i(y|x) \mathcal{ABC} \tag{B.1}$$

where $g_i(y|F_n)$ is the function specifying the probability an object will display a value $y$ on a dimension $i$ given $F_n$ the observed feature structure of all the objects.

# APPENDIX A

# THIS IS THE APPENDIX TITLE

This is an appendix with a title.

$$\alpha\beta\Gamma\Delta \tag{A.1}$$

**Figure A.1** This is an appendix figure caption.

**Table A.1** Appendix table caption

| Alpha | Beta | Gamma | Delta |
|---|---|---|---|
| $\alpha$ | $\beta$ | $\Gamma$ | $\Delta$ |

# APPENDIX B

This is an appendix without a title.

Here is a math test to show the difference between using Computer Modern math fonts and MathTimes math fonts. When MathTimes math fonts are used the letters in an equation will match TimesRoman italic in the text. (*g, i, y, x, P, F, n, f, etc.*) Caligraphic fonts, used for $\mathcal{ABC}$ below, will stay the same in either case.

$$g_i(y|f) = \sum_x P(x|F_n) f_i(y|x) \mathcal{ABC} \tag{B.1}$$

where $g_i(y|F_n)$ is the function specifying the probability an object will display a value $y$ on a dimension $i$ given $F_n$ the observed feature structure of all the objects.

# APPENDIX C

# ALTERNATE REFERENCE STYLES

# REFERENCES


1. J. S. Kilby, "Invention of the Integrated Circuit," *IEEE Trans. Electron Devices,* **ED-23,** 648 (1976).
2. R. W. Hamming, *Numerical Methods for Scientists and Engineers*, Chapter N-1, McGraw-Hill, New York, 1962.
3. J. Lee, K. Mayaram, and C. Hu, "A Theoretical Study of Gate/Drain Offset in LDD MOSFETs" *IEEE Electron Device Lett.,* **EDL-7**(3). 152 (1986).
4. A. Berenbaum, B. W. Colbry, D.R. Ditzel, R. D Freeman, and K.J. O'Connor, "A Pipelined 32b Microprocessor with 13 kb of Cache Memory," it Int. Solid State Circuit Conf., Dig. Tech. Pap., p. 34 (1987).

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[Ber87] A. Berenbaum, B. W. Colbry, D.R. Ditzel, R. D Freeman, and K.J. O'Connor, "A Pipelined 32b Microprocessor with 13 kb of Cache Memory," it Int. Solid State Circuit Conf., Dig. Tech. Pap., p. 34 (1987).




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