

TITLE OF YOUR THESIS

A Dissertation

submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in
The Department of Mechanical Engineering

by
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B.S., Mechanical Engineering, Louisiana State University, 1996
May, 2004

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Acknowledgements

The acknowledgment is the place to thank the faculty, staff, family, and friends who have assisted you in preparing your thesis or dissertation. You may also acknowledge any support or special research materials given you.

MacKichan Software, Inc. would like to thank Frank Muldoon for providing the Louisiana State University typesetting specification he created using the Style Editor.

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Abstract

This shell document was created from a doctoral dissertation that was successfully submitted to the Department of Mechanical Engineering at Louisiana State University. Replace this text with the text for your abstract.

Chapter 1 Sample Mathematics and Text

1.1 In-line and Displayed Mathematics

The expression $\sum_{i=1}^{\infty} a_i$ is in-line mathematics, while the numbered equation

$$\sum_{i=1}^{\infty} a_i \tag{1.1}$$

is displayed and automatically numbered as equation 1.1.

Let H be a Hilbert space, C be a closed bounded convex subset of H , T a nonexpansive self map of C . Suppose that as $n \rightarrow \infty$, $a_{n,k} \rightarrow 0$ for each k , and $\gamma_n = \sum_{k=0}^{\infty} (a_{n,k+1} - a_{n,k})^+ \rightarrow 0$.

Then for each x in C , $A_n x = \sum_{k=0}^{\infty} a_{n,k} T^k x$ converges weakly to a fixed point of T (?).

Two sets of \LaTeX parameters govern mathematical displays.¹ The spacing above and below a display depends on whether the lines above or below are short or long, as shown in the following examples.

A short line above:

$$x^2 + y^2 = z^2$$

and a short line below.

A long line above may depend on your margins

$$\sin^2 \theta + \cos^2 \theta = 1$$

as will a long line below. This line is long enough to illustrate the spacing for mathematical displays, regardless of the margins.

1.2 Mathematics in Section Heads $\int_{\alpha}^{\beta} \ln t dt$

Mathematics can appear in section heads. Note that mathematics in section heads may cause difficulties in typesetting styles with running headers or table of contents entries.

¹ \LaTeX automatically selects the spacing depending on the surrounding line lengths.

1.3 Theorems, Lemmata, and Other Theorem-like Environments

A number of theorem-like environments is available. The following lemma is a well-known fact on differentiation of asymptotic expansions of analytic functions.

Lemma Let $f(z)$ be an analytic function in \mathbb{C}_+ . If $f(z)$ admits the representation

$$f(z) = a_0 + \frac{a_1}{z} + o\left(\frac{1}{z}\right), \quad (1.2)$$

for $z \rightarrow \infty$ inside a cone $\Gamma_\varepsilon = \{z \in \mathbb{C}_+ : 0 < \varepsilon \leq \arg z \leq \pi - \varepsilon\}$ then

$$a_1 = -\lim_{z \rightarrow \infty, z \in \Gamma_\varepsilon} z^2 f'(z), \quad (1.3)$$

Proof Change z for $1/z$. Then $\Gamma_\varepsilon \rightarrow \bar{\Gamma}_\varepsilon = \{z \in \mathbb{C}_- : \bar{z} \in \Gamma_\varepsilon\}$ and

$$f(1/z) = a_0 + a_1 z + o(z). \quad (1.4)$$

Fix $z \in \bar{\Gamma}_\varepsilon$, and let $C_r(z) = \{\lambda \in \mathbb{C}_- : |\lambda - z| = r\}$ be a circle with radius $r = |z| \sin \varepsilon/2$. It follows from (1.4) that

$$\frac{1}{2\pi i} \int_{C_r(z)} \frac{f(\lambda) d\lambda}{(\lambda - z)^2} = \sum_{m=0}^1 a_m \frac{1}{2\pi i} \int_{C_r(z)} \frac{(\lambda - z_0)^m d\lambda}{(\lambda - z)^2} + R(z), \quad (1.5)$$

where for the remainder $R(z)$ we have

$$\begin{aligned} |R(z)| &\leq r^{-1} \max_{\lambda \in C_r(z)} o(|z|) = r^{-1} \max_{\lambda \in C_r(z)} |\lambda| \cdot O(|z| + r) \\ &= \frac{|z| + r}{r} \cdot O(|z| + r) = \frac{1 + \sin \varepsilon}{\sin \varepsilon} \cdot O(|z|). \end{aligned}$$

Corollary Therefore $R(z) \rightarrow 0$ as $z \rightarrow \infty, z \in \bar{\Gamma}_{\varepsilon/2}$, and hence by the Cauchy theorem (1.5)

implies

$$\frac{d}{dz} f(1/z) = a_1 + R(z) \rightarrow a_1, \text{ as } z \rightarrow \infty, z \in \bar{\Gamma}_{\varepsilon/2},$$

that implies (1.3) by substituting $1/z$ back for z .

Chapter 2 Features of this Shell

2.1 Section Headings

Use the Section tag for major sections, and the Subsection tag for subsections.

2.1.1 Subsection

This is some harmless text under a subsection.

2.1.1.1 Subsubsection

This is some harmless text under a subsubsection.

2.2 Tags

You can apply the logical markup tag *Emphasized*.

You can apply the visual markup tags **Bold**, *Italics*, Roman, **Sans Serif**, *Slanted*, SMALL CAPS, and Typewriter.

You can apply the special, mathematics only, tags *fraktur*, BLACKBOARD BOLD, and *CALLIGRAPHIC*. Note that blackboard bold and calligraphic are correct only when applied to uppercase letters A through Z.

You can apply the size tags `tiny`, `scriptsize`, `footnotesize`, `small`, `normalsize`, `large`, **Large**, **LARGE**, **huge** and **Huge**.

This is a Body Math paragraph. Each time you press the Enter key, Scientific WorkPlace switches to mathematics mode. This is convenient for carrying out “scratchpad” computations. Following is a group of paragraphs marked as Body Quote. This environment is appropriate for a short quotation or a sequence of short quotations.

The only thing we have to fear is fear itself. *Franklin D. Roosevelt*, Mar. 4, 1933
Ask not what your country can do for you; ask what you can do for your country. *John F. Kennedy*, Jan. 20, 1961
There is nothing wrong with America that cannot be cured by what is right with America. *William J. “Bill” Clinton*, Jan. 21, 1993

2.3 List Environments

You can create numbered, bulleted, and description lists using the tag popup at the bottom left of the screen.

(1) List item 1

(2) List item 2

(a) A list item under a list item.

The typeset style for this level is different than the screen style. The screen shows a lower case alphabetic character followed by a period while the typeset style uses a lower case alphabetic character surrounded by parentheses.

(b) Just another list item under a list item.

(I) Third level list item under a list item.

(i) Fourth and final level of list items allowed.

- Bullet item 1

- Bullet item 2

- Second level bullet item.

- * Third level bullet item.

- Fourth (and final) level bullet item.

Description List Each description list item has a term followed by the description of that term. Double click the term box to enter the term, or to change it.

Bunyip Mythical beast of Australian Aboriginal legends.

Appendix A The First Appendix

The appendix can contain technical proofs and derivations that can be separated from the main text..Generally, avoid using appendices; however sometimes they serve a useful purpose for data that cannot be presented easily as a table or a figure.

References

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Southall, Richard, First principles of typographic design for document production, *TUGboat* Vol. 5 (1984), No. 2, 79–90; *Corrigenda*, Vol. 6 (1985), No. 1, p. 6.

TUGboat, the Newsletter of the T_EX Users Group, T_EX Users Group, c/o American Mathematical Society, P. O. Box 9506, Providence, RI, 02940.

Vita

Replace this text with a short pertinent autobiography.