PARAMETER ADVISING FOR MULTIPLE SEQUENCE ALIGNMENT

by

Daniel Frank DeBlasio

A Dissertation Submitted to the Faculty of the

DEPARTMENT OF COMPUTER SCIENCE

In Partial Fulfillment of the Requirements

For the Degree of

DOCTOR OF PHILOSOPHY

In the Graduate College

THE UNIVERSITY OF ARIZONA

2016

THE UNIVERSITY OF ARIZONA
GRADUATE COLLEGE

As members of the Dissertation Committee, we certify that we have read the dissertation prepared by Daniel Frank DeBlasio, entitled Parameter Advising for Multiple Sequence Alignment and recommend that it be accepted as fulfilling the dissertation requirement for the Degree of Doctor of Philosophy.

John Kececioglu — Date: 15 April 2016

Alon Efrat — Date: 15 April 2016

Stephen Kobourov — Date: 15 April 2016

Mike Sanderson — Date: 15 April 2016

Final approval and acceptance of this dissertation is contingent upon the candidate's submission of the final copies of the dissertation to the Graduate College.

I hereby certify that I have read this dissertation prepared under my direction and recommend that it be accepted as fulfilling the dissertation requirement.

Dissertation Director: John Kececioglu — Date: 15 April 2016

STATEMENT BY AUTHOR

This dissertation has been submitted in partial fulfillment of requirements for an advanced degree at the University of Arizona and is deposited in the University Library to be made available to borrowers under rules of the Library.

SIGNED: Daniel Frank DeBlasio

ACKNOWLEDGEMENTS

Insert your acknowledgements here.

This should be one page maximum, and is single-spaced by default.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABSTRACT

Abstract text

CHAPTER 1

Introduction and Background

Overview

This gives some preview of what is contained in this chapter.

1.1 Introduction

At this point you may want to include a figure, such as the one below:

1.2 Background

Maybe this section should have a table:

1.3 Plan of the dissertation

This may refer to chapters other than Chapter 1

This template was used to produce my dissertation (DeBlasio, 2016), and it was passed around by graduate students at the University of Arizona. At this point, I

```
d1gvoa    203 ... gsvenrarlvlevvdavcnewsad-RIGIRVSPigtfqnvdngpnee--adalyl--- ... 255
d2dora    141 ... ydfeatekllke-----vftfftk-PLGVKLPPyf---------------dlvhfdim ... 178
d1oyb     215 ... gsienrarftlevvdalveaighe-KVGLRLSPygvfnsmsggaetgivaqyayvage ... 272
d1o94a1   193 ... gslenrarfwletlekvkhavgsdcAIATRFGV-----------------dtvygpgq ... 234
d1ep3a    147 ... tdpevaaalvka-----ckavskv-PLYVKLSPnvt--------------divpiaka ... 185
```

(a) Higher Accuracy Alignment

```
d1gvoa    184 ... yl-lhqflspssnqrtdqyggsvenrarlvlevvdavcnewsad-RIGIRVSPigtfq ... 240
d2dora    159 ... kP-LGVKLPPyf--dlvhfdimaeilnqfpltYVNSV-nsig----nglfidpeaesv ... 209
d1oyb     196 ... yl-lnqfldphsntrtdeyggsienrarftlevvdalveaighe-KVGLRLSPygvfn ... 252
d1o94a1   174 ... yl-plqflnpyynkrtdkyggslenrarfwletlekvkhavgsdcAIATRF---GVdt ... 228
d1ep3a    164 ... kvPLYVKLSPnv-tdivpiakaveaagadGLTMIntl---------mgvrfdlktrqp ... 212
```

(b) Lower Accuracy Alignment

Figure 1.1: This is the caption that ends up below the figure.

Table 1.1: ***This is above the table itself***

Parameter choice $(\sigma, \gamma_I, \gamma_E, \lambda_I, \lambda_E)$	Advisor set: Default	Greedy	Exact	Oracle
$k = 2$				
$(\texttt{VTML200}, 50, 17, 41, 40)$	(2)	(2)		
$(\texttt{VTML200}, 55, 30, 45, 42)$		(2)	(3)	(1)
$(\texttt{BLSUM80}, 60, 9, 43, 42)$			(2)	
$(\texttt{BLSUM45}, 65, 35, 44, 44)$				(3)
$k = 3$				
$(\texttt{VTML200}, 50, 17, 41, 40)$	(2)	(2)		
$(\texttt{VTML200}, 55, 30, 45, 42)$		(3)	(5)	(1)
$(\texttt{BLSUM80}, 60, 26, 43, 43)$		(2)	(2)	
$(\texttt{VTML200}, 55, 30, 41, 40)$			(6)	
$(\texttt{VTML40}, 45, 29, 40, 39)$				(7)
$(\texttt{BLSUM62}, 65, 16, 44, 42)$				(8)
$k = 4$				
$(\texttt{VTML200}, 50, 17, 41, 40)$	(2)	(2)		
$(\texttt{VTML200}, 55, 30, 45, 42)$		(3)	(9)	(6)
$(\texttt{BLSUM80}, 60, 26, 43, 43)$		(2)		
$(\texttt{VTML200}, 60, 15, 41, 40)$		(1)		
$(\texttt{VTML200}, 45, 6, 40, 40)$			(8)	(1)
$(\texttt{VTML200}, 55, 30, 41, 40)$			(8)	
$(\texttt{BLSUM80}, 55, 19, 43, 42)$			(1)	
$(\texttt{VTML40}, 45, 29, 40, 39)$				(4)
$(\texttt{BLSUM62}, 65, 35, 44, 42)$				(3)

do not think they require a template, but some may still find it useful.

REFERENCES

DeBlasio, D. F. (2016). ***Parameter Advising for Multiple Sequence Alignment***. PhD dissertation, Department of Computer Science, The University of Arizona.