

MIT Application for Graduate Admission 2008

Please read instructions carefully before you complete this form. Please print clearly or type.

1 Proposed date of entrance: February June September Year: **2008**

2 Department Health Sciences and Technology Area of research or interdisciplinary program Medical Engineering / Medical Physics
consult department listings in Book I

3 Initial degree objective at MIT Ph.D. Final degree objective (if different) Ph.D.

4 Are you applying to more than one department? Yes No If yes, indicate departments _____

5 Full legal name **Confidential**
last/family/surname first middle

Former name (if any) _____

7 Female Male

8 Ethnicity (optional):
US citizens and permanent residents only

<input type="checkbox"/> African-American/Black	<input type="checkbox"/> Caucasian/White	<input type="checkbox"/> Native American <small>Tribal affiliation</small>
<input type="checkbox"/> Afro-Caribbean	<input type="checkbox"/> Chicano or Mexican-American	<input type="checkbox"/> Other <small>Please describe</small>
<input type="checkbox"/> African parentage	<input type="checkbox"/> Puerto Rican	
<input type="checkbox"/> Asian-American	<input type="checkbox"/> Other Hispanic	

9 Reply address **Confidential**

10 Permanent address **Confidential**

11 Daytime phone **Confidential**

12 Fax number **Confidential**
country code area code/city code number

13 City, state and country of birth **Confidential**, United States of America Citizen of United States of America US Social Security # (if any) **Confidential**

If a foreign citizen in the US, give date of entry _____ Type of visa _____ I-20 ID Number _____
month day year

If an Exchange Visitor (J), give program number and name of sponsor _____

Permanent resident of _____ If a permanent resident (immigrant) of the US, give alien registration number _____

14 Have you previously applied for admission to MIT? Yes No MIT ID _____
if assigned one as a former student

If yes, what status? Freshman Transfer Special Graduate Date: _____ Department: _____

15 List all colleges and universities attended, major field, dates of attendance and name of degrees received or expected (list most recent first):

College/University	Location	Major field	Dates attended	Actual name of degree/diploma	Date degree awarded/expected
BRIGHAM YOUNG UNIV PROVO, UT		Unknown, Other / Bioinformatics	09-2002 04-2008	SB	04-2008

16 Other graduate schools to which you are applying _____

For department use:	<input type="radio"/> Admitted	<input type="radio"/> Cond. Admitted	Degree _____	Term _____	By _____	Date _____	<input type="radio"/> Not approved
	<input type="radio"/> Admitted	<input type="radio"/> Cond. Admitted	Degree _____	Term _____	By _____	Date _____	<input type="radio"/> Not approved

MIT Application for Graduate Admission (continued from front)

17 Entrance tests: GRE: Date taken or to be taken: 08-2007 Scores: verbal 620 quantitative 800 analytic 4.5
GRE Subject: Date taken or to be taken: _____ Scores: _____ Subject: _____
GMAT: Date taken or to be taken: _____ Scores: _____
TOEFL: Date taken or to be taken: _____ Scores: _____

18 List language of instruction in: primary school; English; secondary school English
university English; graduate school _____ Native language if other than English: _____

19 Names of three persons to whom you have given evaluation forms. (Request those persons to return the completed forms to you in time to meet the appropriate deadline.)

<u>Dr. Ken Rodham</u> <small>name</small>	<u>Assistant Teaching Professor</u> <small>title</small>	<u>Brigham Young University</u> <small>institution/company</small>
<u>Dr. Keith Crandall</u> <small>name</small>	<u>Professor</u> <small>title</small>	<u>Brigham Young University</u> <small>institution/company</small>
<u>Dr. Anindya Roy</u> <small>name</small>	<u>Associate Professor</u> <small>title</small>	<u>University of Maryland BC</u> <small>institution/company</small>

20 Please give the names, years of graduation, department affiliation, and relationships of any close relatives who have attended MIT:

21 Your honors, prizes, or major publications: _____
See comments.

22 Your extracurricular activities and accomplishments: _____
See comments.

23 Your teaching or professional experience including summer and term-time work. Give name of employer, dates, and nature of work:
See comments.

24 Other experience, including military, volunteer work, travel. Give dates and nature of work: _____
See comments.

International students (non-immigrant visa holders) please complete the following:

25 Your marital status: Single Married Number of children _____
If single, do you intend to marry before you come here? Yes No Will your spouse come with you? Yes No

26 Signature: Confidential Date: 12-15-2007

Record of Courses Taken in Preparation for Graduate Study

Please carefully read the instructions below before you complete this form.

Based on your transcript(s), please complete the following summary of your college and university classes.

General instructions:

- Important: some departments do not require this form; other departments require only some of the fields to be completed—check the requirements for the department to which you are applying before completing this form. See pages 4–16 of this booklet.
- This form is **not** required for courses taken at MIT (except for the Department of Physics).
- If the department to which you are applying requires this form, a transcript will not be accepted as a substitute for this information.
- If your university system does not fit with the categories below—for example, if your courses do not have numbers or you did not receive course grades—leave those fields blank.
- Do not try to convert your university grading scale or GPA to MIT's scale. Indicate the grades/GPA as granted by your school and give us a brief explanation of your school's grading system.
- If the space provided is not sufficient, you may attach additional sheets.

Why we ask you to complete this form:

- We see transcripts from thousands of schools from all over the world. It is extremely helpful for us to review applicants' coursework and grades in a standard format.
- Transcripts show courses by semester or year. However, the best way for us to evaluate your preparation is to see your courses grouped by subject area, with the most relevant courses at the top.
- Transcripts do not list textbooks used; many departments find that information especially helpful.

Grading System:

Please describe the grading system(s) used at all colleges and universities you have attended. Explain the specific meaning of any numeric values, letter grades, and rankings. _____

Cumulative GPA as listed on transcript (if available) _____

COURSES MOST RELEVANT TO THE PROGRAM TO WHICH YOU ARE APPLYING

Please list below the college/university courses you have taken that are most relevant to the graduate program to which you are applying. Group courses by subject area, for example, group all math courses together and group all science courses together, etc. Use the next section, if you need more room.

Course no. (if applicable)	Course name	Principal textbook used (author and title)	Year in which course was taken	Official course grade (if applicable)
InBio 465	Bioinformatics		Wint 08	
InBio 365	Computational Biology	Bioinformatics and Molecular Evolution, Higgs & Attwood	Fall 07	
Biol 420	Evolutionary Biology	Evolution, Futuyma	Fall 06	A
InBio 265	Genomics	From Genes to Genomes, Dale & Schantz	Fall 06	B+
Biol 420	Genetics	Genetics: The Continuity of Life, Fairbanks	Wint 06	A
McBio 230	General Molecular Genetics		Wint 03	A
InBio 370	Bioethics		Wint 07	A-
CS 240	Advanced Programming Concepts	Object-Oriented Programming in C++, Lafore	Fall 06	A
CS 236	Discrete Structures	Logic and Discrete Mathematics, Grassmann	Wint 07	A
CS 235	Data Structures	Data Structures and Problem Solving Using Java, Weiss	Wint 06	A
CS 142	Intro to Computer Programming	Java Software Solutions, Lewis & Loftus	Fall 05	A
Stat 441	Stat Theory 1	Introduction to Probability and Mathematical Statistics 2nd Ed, Bain & Engelhardt	Wint 07	A

ADDITIONAL COURSES

Please list below other college/university courses you have taken. Group courses by subject area (science, math, engineering, humanities, social sciences, etc.). You may also use this section for any courses that you could not fit in the section above.

Course no.

(if applicable)

Course name

Principal textbook used (author and title)

Year in which course was taken

Official course grade (if applicable)

Course no. (if applicable)	Course name	Principal textbook used (author and title)	Year in which course was taken	Official course grade (if applicable)
Stat 442	Stat Theory 2	Probability and Mathematical Statistics 2nd Ed, Bain & Engelhardt	Fall 07	A
Math 410	Intro to Numeric Methods	Numerical Analysis 8th Ed, Burden & Faires	Fall 07	A
Math 343	Elem. Linear Algebra		Fall 02	A
Math 334	Ordinary Differential Equations	Elementary Differential Equations, Boyce	Wint 06	A
Math 214	Calculus of Several Variables		Wint 03	A
Port 315	Intermediate Portuguese		Fall 05	A
Port 321	3rd Year Grammar & Composition		Fall 05	A
Port 355	Brazilian Civilization		Fall 05	A
Port 326	Phonetics and Pronunciation		Fall 06	A
Port 339	Intro to Portuguese and Brazilian Literature		Fall 07	
Hist 201H	Honors World Civilization to 1500		Fall 02	A
Hon P 202	Civilization 2		Wint 03	A
A HTG	American Heritage		Wint 03	A
Psyc 111H	Honors General Psychology		Fall 02	B+
FamLf 100	Strengthening Marriage & Family		Wint 06	A
Hon P 200	Honors Freshman Writing		Fall 02	A
Engl 316	Technical Writing		Wint 07	A
Rel A 121	Intro to the Book of Mormon		Fall 02	A
Rel A 122	Honors Intro to Book of Mormon		Wint 03	A
Rel A 211	The New Testament		Fall 05	A
Rel A 212	The New Testament		Wint 06	A
Rel A 301	The Old Testament		Fall 06	A
Rel A 302	The Old Testament		Wint 07	A-
Rel C 324	The Doctrine and Covenants		Fall 07	
Music 325	Symphonic Orchestra		F02 -	A,A
Music322R	University Band		Wint 06	A
Music321R	University Orchestra		F06,F0	A, --
Music324R	Cougar Band		Wint 03	A
Music 200	Elements of Music		Wint 03	A

Brigham Young University

Provo, Utah 84602

STUDENT INFORMATION

NAME : [REDACTED]
 BYU ID : [REDACTED]
 SSN : [REDACTED]
 BIRTHDATE : Jul 18
 GENDER : Male
 DEPARTMENT : Biology
 BACHELORS MAJOR : Bioinformatics
 MINOR : Mathematics
 MINOR : Portuguese

DEGREES AWARDED - BRIGHAM YOUNG UNIVERSITY
 No degrees awarded at BYU as of December 13, 2007

BYU COURSE WORK

TEACH AREA	CRS NO.	SEC NO.	COURSE DESCRIPTION	SEM HRS	GRD
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Fall Semester 2002					
HIST	201H	202	Honors World Civilization to 1500	3.0	A
HON P	200	005	Honors Writing	3.0	A
HON P	214R	014	Late Summer Honors	1.0	A-
HON P	214R	417	Freshman Honors Expt	1.0	A
MATH	343	010	Elem Linear Algebra	3.0	A
MUSIC	325R	001	Symphonic Band	1.0	A
PSYCH	111H	200	Honors General Psychology	3.0	B+
REL A	121	041	Intro to the Book of Mormon	2.0	A
SEM HR ERN	17.0		GPA 3.88		

Winter Semester 2003					
A HTG	100H	200	Honors American Heritage	3.0	A
HON P	202	003	Civilization 2	3.0	A-
MATH	214	006	Calculus of Several Variables	3.0	A
MATH	230	001	Gen Molec Genetics	3.0	A
MUSIC	200	001	Elements of Music	1.0	A
MUSIC	324R	001	Cougar Band	1.0	A
MUSIC	325R	001	Symphonic Band	1.0	A
REL A	122H	201	Honors Intro to Book of Mormon	2.0	A
SEM HR ERN	17.0		GPA 3.95		

Fall Semester 2005					
C S	142	001	Intro to Computer Programming	3.0	A
DANCE	180	030	Social Dance, Beginning	0.5	B+
PORT	315	001	Intermediate Portuguese	3.0	A
PORT	321	002	3rd Yr Grammar & Composition	3.0	A
PORT	355	001	Brazilian Civilization	3.0	A
REL A	211	023	The New Testament	2.0	A
SEM HR ERN	14.5		GPA 3.98		

*** Continued on Next Column ***

BYU COURSE WORK

TEACH AREA	CRS NO.	SEC NO.	COURSE DESCRIPTION	SEM HRS	GRD
Winter Semester 2006					
BIOL	340	003	Genetics	2.0	A
C S	235	003	Data Structures	3.0	A
CHEM	152	002	Introductory Organic Chemistry	2.0	A
DANCE	280	001	Social Dance, Intermediate	1.0	A
FAM/F	100	001	Strengthening Marr & Family	3.0	A
MATH	334	003	Ordinary Differential Equation	3.0	A
MUSIC	322R	001	University Band	1.0	A
REL A	212	019	The New Testament	1.0	A
SEM HR ERN	17.0		GPA 4.00		

Summer Term 2006					
MMDIO	399R	004	Academic Internship	7.0	A
SEM HR ERN	7.0		GPA 4.00		

Fall Semester 2006					
BIOL	420	001	Evolutionary Biology	2.0	A
C S	240	002	Adv Programming Concepts	3.0	A
INBIO	265	001	Genomics	3.0	B+
MUSIC	321R	008	University Orchestra	1.0	A
PORT	326	001	Phonetics & Pron	3.0	A
REL A	301	004	The Old Testament	2.0	A
SEM HR ERN	14.0		GPA 3.87		

Winter Semester 2007					
C S	236	002	Discrete Structure	3.0	A
ENGL	316	008	Technical Writing	3.0	A
EXXC	105	003	Healthy Living	0.5	A
INBIO	370	001	Bioethics	2.0	A-
INBIO	494R	014	Mentored Research	1.0	A
MUSIC	322R	001	University Band	1.0	A
REL A	302	001	The Old Testament	2.0	A-
STAT	441	002	Stat Theory 1	3.0	A
SEM HR ERN	15.5		GPA 3.92		

Summer Term 2007					
MMDIO	399R	004	Academic Internship	7.0	A
SEM HR ERN	7.0		GPA 4.00		

*** Continued on Page 2 ***

HEALTH SERVICES AND TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY
 77 MASSACHUSETTS AVE, E25-518
 CAMBRIDGE MA 02139-4307



This officially sealed and signed transcript is printed on blue SCRIP-SAFE security paper with the name of the university printed in small type across the face of the document. A raised seal is not required. When photocopied the word COPY should appear. A BLACK ON WHITE OR A COLOR COPY SHOULD NOT BE ACCEPTED!

Jeffery N. Bunker, Registrar

Brigham Young University

Provo, Utah 84602

2007

INFORMATION

Con

Jul 18

Male

Biology

Biostatistics

Mathematics

Portuguese

TRANSFER CREDITS ACCEPTED

ADVANCED PLACEMENT

PHYSICS C - MECHANICS

PHYSICS C - ELECTRICITY/MAGNET

PHYSICS 121

PHYSICS 122

AP HR ERN 27.0 HR GRD 0.0

TRN HR ERN 27.0 HR GRD 0.0

TOT HR ERN 152.0 HR GRD 125.0

***** End of Transcript *****

WORK

S SEC H

COURSE DESCRIPTION

SEM GRD

HRS

(CONT.)

1st Sem Port Conv

2nd Sem Port Conv

16.0 HR GRD 16.0 GPA 4.00

2 20055

2 20055

1st Sem Port Conv

2.0 A 2.0 A

16.0 HR GRD 125.0 GPA 3.95

EDITS ACCEPTED

25 Score = 5

Gen College Chem

4.0 P

Gen College Chem

3.0 P

AP Credit

College Writing & Reading

3.0 P

Calculus 1

4.0 P

Calculus 2

4.0 P

*** continued on Next Column ***

HEALTH SERVICES AND TECHNOLOGY

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

77 MASSACHUSETTS AVE, R25-518

CAMBRIDGE MA 02139-4307

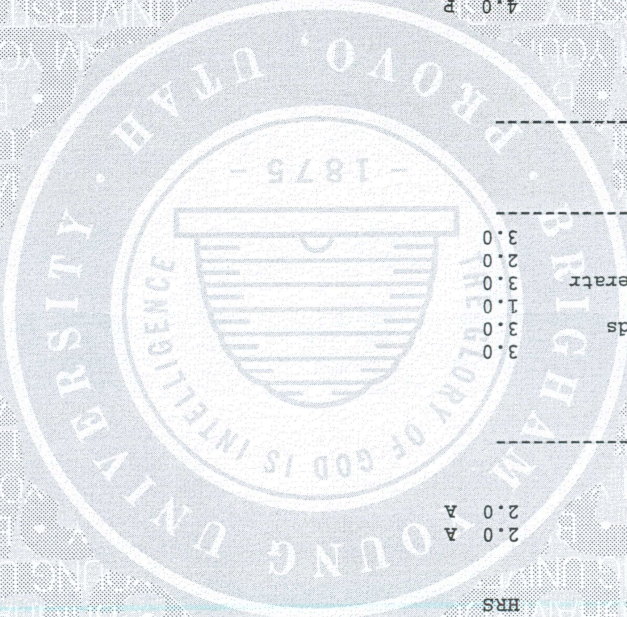
Jeffery N. Bunker, Registrar

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university printed in small type across the face of the document. A raised seal is not required. When

the word COPY should appear. A BLACK ON WHITE OR A COLOR COPY SHOULD NOT BE AC-

CEPT DOCUMENT IS SIGNATURE ABOVE IS DISTORTED



Statement of Objectives

Please read instructions carefully before you complete this form.

Please give your reasons for wishing to do graduate work in the field you have chosen. Prepare your statement of objectives and goals in whatever form clearly presents your views. Include as far as you can, your particular interests, be they experimental, theoretical, or issue-oriented, and show how your background and MIT's programs support these interests. The statement could be much like a proposal for graduate studies, in the more specific context of your professional objectives. You should set forth the issues and problems you wish to address. Explain your longer-term professional goals. The Admissions Committee will welcome any factors you wish to bring to its attention concerning your academic and work experience to date.

Although I've heard that there are many job opportunities for those with only a B.S. in Bioinformatics, I believe that continuing my education will improve my skills and knowledge and increase my potential in the field. I want to eventually teach at the university level, and the precursor to that kind of career is a PhD.

I am interested in pursuing a graduate program in biology, specifically bioinformatics, because I am interested by the problems and questions in the field of genetics. I am fascinated by the complexity of the genetic system, how the same genes can be expressed differently, and that the resulting proteins can be modified due to environmental factors, resulting in different proteomes. I also enjoy the methodology and techniques of computer science and statistics [especially Bayesian statistics], and pursuing a degree in bioinformatics gives me the opportunity to prepare for a career in which I can apply these tools to the questions that interest me.

Some of the questions I would like to pursue are: What kinds of phenotypically significant mutations exist in non-coding regions, including regulatory regions? How can these regions be identified? How does the phenotypic effect non-coding regions compare to that of coding regions? I think it would be very interesting to try to map different levels of gene expression to their promoters: to compare individuals across a population with detectable differences in expression for a particular gene, and see if a corresponding pattern of differences can be detected in that gene's regulatory region. I am also interested in micro-array analysis, population genetics, and comparative genomics.

I have tried to prepare myself for graduate studies by pursuing several research opportunities throughout my undergraduate experience. After my sophomore year, I participated in an internship at Iowa State University under the direction of Dr. Qunfeng Dong. Our goal was to redesign the EST assembly pipeline used to curate data for ISU's online plant genome database [plantgdb.org]. The database contains Putative Unique Transcripts [PUT's] of EST sequences. Each PUT is created by combining overlapping EST sequences. The idea behind this setup is that overlapping EST's are potentially part of the same gene, and not unique genes themselves. The previous version was not able to handle some of the newer, large releases of EST libraries, and we hoped to modify the process to make it more robust against the larger datasets. The old process also completely rebuilt the set of curated data each time new sequences were added. We hoped to make the process faster by letting it build upon the data we had already processed, instead of starting from scratch each time.

My responsibility in the project was to examine the old pipeline and integrate a new step. This step compared the new EST data set to the previous set of PUT's. Then PUT's which overlapped with new EST's were disassembled and these PUT sequences and overlapping EST's were passed on to the rest of the pipeline. Thus, of the previous data set, only the parts affected by the new data were reprocessed, saving time and decreasing the size of the problem. I presented some of my work during a poster session at the bioinformatics symposium hosted by ISU that summer.

During this internship I learned how to program in Perl. I also learned how to handle very large datasets, and I was exposed to parallel processing. I was introduced to a few bioinformatics programs, namely Cap3, PaCE, and Vmatch.

During this past summer, three other interns and I worked with Dr. Anindya Roy at the University of Maryland Baltimore County to develop and test a new algorithm for calculating the positive false discovery rate [pFDR] for large scale hypothesis testing. We used the expectation maximization algorithm to estimate the parameters of mixed skew-normal distributions used to model probit p-values. We used the estimated distributions to calculate the likelihood that each p-value was modeled by the null hypothesis. We simulated data from known mixed skew-normal distributions to benchmark the algorithms capacity to accurately model data. We found that our estimates performed with a smaller mean square error

- Type or print using black ink.
- Use reverse side if necessary or separate form.
- Keep a copy for your file. You may also wish to provide copies to your evaluators before they complete their forms.
- Return this form with the completed application to the appropriate MIT department (see pages 4–16).

Statement of Objectives (Cont.)

than current methods in several cases.

My work focused on writing MATLAB scripts to perform our algorithm and test its accuracy, as well as assisting in developing and reviewing some of the formulas we used. I also helped write and revise our research paper. We presented our work and results at a poster session during the school's summer program presentation event. Our paper will be submitted for publication soon.

During this internship I learned a lot about statistics theory and how to apply that theory to our problem. I learned about the Expectation/Maximization algorithm and how it can be implemented. I also learned how to program in MATLAB.

In Winter Semester of 2007, I participated in the Bioinformatics Research Group [BiRG] at Brigham Young University. Dr. David McClellan was our mentor. Our goal was to identify conserved, functional regions of the cancer-linked gene p53. We identified several proteins that are known to interact with p53. We then identified several species of which the sequences for these proteins were known, coming up with a collection of about 7 species and 9 proteins. Using software developed by Dr. McClellan [TreeSAAP], we were able to identify regions where complementary mutations between p53 and the other proteins had occurred, thus identifying potential functional regions under positive selection.

My work focused on helping to find the species and proteins we could use in the experiment. I helped manage group efforts and helped organize the group's findings and data. Over the summer, while I was in Maryland, the group performed the analysis with TreeSAAP. This fall, a few of our group members presented some of our work at the Biotechnology and Bioinformatics Symposium [BIOT 2007] in Colorado Springs, CO.

Working with BiRG, I gained more familiarity with the tools available from the National Center for Biotechnology Information [NCBI]. I also became more familiar with the alignment/phylogenetic program MEGA. I served for a time as the group's vice-president.

These research experiences helped me develop skills and gain experience that have prepared me for graduate studies. These skills and experience, combined with the knowledge gained from my undergraduate coursework, have prepared me to think critically and conduct research to answer my questions about biology. MIT's program in Bioinformatics and Integrative Genomics will help me continue to pursue my interests. This program is lead and assisted by capable individuals that are leaders in the field of Bioinformatics, and working with them will help further my skills and knowledge in the field, as well as improve my research skills. I believe MIT's program will increase my capacity to conduct meaningful research that will make a difference in science and medicine.

After I obtain a PhD, I think I would like to work in the industry for a time. All my experience until now has been in an academic environment, and I would like to see if I enjoy the industrial setting. I've heard that the pay is generally better in the industry, which is also worth considering. But I really enjoy teaching, and I would like end my career teaching at the university level, independent of whether or not I start my career in the industry. However, I have not had a lot of experience with choosing my own full-time research topic, and I may find that I would rather stay in academia for my entire career, teaching and leading my own research.

Use this space for additional information or comments, if needed.

Teaching/Professional Experience:

- University of Maryland Baltimore County, Research Intern, June - Aug 2007: I worked with a team of other interns and a faculty mentor [Dr. Anindya Roy] to develop a new algorithm for calculating and controlling the false discovery rate of large scale hypothesis testing.
- Iowa State University, Research Intern, June - Aug 2006: I worked with a faculty mentor [Dr. Qunfeng Dong] to improve a data preparation pipeline for ISU's Plant Genome Database project [www.plantgdb.org].
- Brigham Young University, Computer Science department, Teaching Assistant, Sept 2007 - Present: I help students understand course material and successfully complete course projects. I also evaluate student work.
- Brigham Young University, Department of Mathematics, Teaching Assistant, Sept 06 - April 07: I tutored students in Elem. Linear Algebra, Calculus of Several Variables, and Ordinary Differential Equations.

Volunteer Work:

- Missionary for The Church of Jesus Christ of Latter-day Saints, Aug 03 - Aug 05: As a full-time volunteer representative of the Church, I proselyted and performed various forms of community service in Bahia, Brazil.

Extracurricular Activities:

- 4 years of university bands and orchestras
- 2 semesters of social dance
- Active participation in church service and activities

Honors, prizes, or major publications:

- Recipient of academic scholarships [all 4 years]
- Eligible for Phi Beta Kappa junior and senior years
- Contributor to the Plant Genome Database [www.plantgdb.org]
- "Finite Skew-Mixture Model Estimation for FalseDiscovery Rates" - to be submitted for publication before the end of this year. [Co-authors: Elizabeth A. DeRose, Laina D. Mercer, Laura K. Thayer and Anindya Roy]

MIT Evaluation for Graduate Admission

Please read instructions carefully before you complete this form.

Return to:

Department of _____
Massachusetts Institute of Technology
77 Massachusetts Avenue, Room _____
Cambridge, MA 02139-4307

Part 1 To be completed by all applicants

Please type or print using black ink.

Important: In the upper right of this form, fill in the return address department name and room number (as indicated on pages 4–16 of this booklet).

Name: Confidential
last/family first middle

Applying for admission in the department of Health Sciences and Technology

for the ultimate degree of Ph.D. area of research MEMP

for the term beginning in September 2008 email Confidential

Under the Family Educational Rights and Privacy Act of 1974, a student enrolled at MIT has access to his or her education records. We intend to comply with both the letter and the spirit of this law, while still allowing the student the option of waiving the right to access. If you wish to waive the right to examine this evaluation at a later date, please sign here.

Applicant's signature: Confidential date _____

Part 2 To be completed by evaluator

An application for admission to MIT requires evaluations from three teachers or people capable of judging the professional and academic promise of the applicant. A separate letter of evaluation may be attached to this form if necessary.

Please return in time for her/him to meet the following deadlines: January 15 for June or September admissions for applicants except as follows: December 15 for Aeronautics and Astronautics, Architecture, Biology, Brain and Cognitive Science, Chemistry, Electrical Engineering and Computer Science, Health Sciences and Technology, Leaders for Manufacturing (see <http://lfm.mit.edu> for additional details), Mechanical Engineering, Media Arts and Sciences; December 15 for Operations Research; December 31 for Biological/Engineering and Political Science; January 1 for Physics and Science, Technology and Society; January 2 for Chemical Engineering, Civil and Environmental Engineering, Economics, Linguistics and Philosophy, Mathematics; January 3 for Urban Studies and Planning; January 5 for Earth, Atmospheric and Planetary Sciences; January 7 for Nuclear Science and Engineering; January 10 for Computation for Design and Optimization, Engineering Systems Division and Technology and Policy Program; and February 15 for Center for Real Estate. November 1 is the deadline for the February term. January 12 and April 6 are the deadlines for Round 1 and Round 2, respectively, for the Master of Engineering in Logistics (MLOG) Program. For the Evaluation Form, please go to <http://www.mit.edu/mlog/>. For the Systems Design and Management Evaluation Form, please go to <http://sdm.mit.edu>.

Evaluator's name: Ken Rodham Title Asst. Teaching Prof. of Computer Science

Address BYU CS Dept., 3361 TMCB Provo Utah 84062 USA

email rodham@cs.byu.edu Date 12-15-2007

School or company Brigham Young University Telephone number 801-422-5498

In what capacity do you know the applicant? Con took two of my CS classes and works for me as a teaching assistant

How long have you known the applicant? 2 years

How does this applicant compare with his or her peer group in academic ability?

- Truly exceptional *equivalent to the very best you have known – a person who, in your experience, appears only every few years* Outstanding *comparable to the best student in a current class* Well above average *top 25%* Above average *demonstrated high ability* Average *able to complete work to the Ph.D.* Below average *lower 50%* Inadequate opportunity to observe

In your opinion, how would this student compare to other students in the graduate program at MIT?

- Truly exceptional Outstanding Well above average Above average Average Below average Inadequate opportunity to observe

Please give the applicant's relative standing in your department (e.g., 7th in 89) 12th in 371

(continue on reverse side)

November 24, 2007

Dear Graduate Admissions Committee:

It is my pleasure to recommend [Con] for admission to the Bioinformatics and Integrative Biology Ph.D. Program at M.I.T. [Con] is a Bioinformatics major at Brigham Young University. As part of his major requirements [Con] has taken two of my Computer Science courses. The first was a beginning Data Structures and Algorithms course; the second was an Advanced Computer Programming course. [Con] excelled in both courses, and was one of my top students. This is especially significant considering the fact that he was competing primarily with Computer Science and Engineering majors in both courses, and still outperformed the majority of his classmates. Currently, [Con] works for me as a teaching assistant in my Advanced Computer Programming course.

In the classroom I had the opportunity to interact fairly extensively with [Con]. This interaction was facilitated by his tendency to sit on the front row. [Con] frequently asked insightful, relevant questions that measurably enhanced the classroom experience for everyone, including me. He also often asked additional questions after class in a one-on-one setting, which demonstrated his genuine interest in the material. As a TA, [Con] is exceptionally dependable. He is also exceptionally skilled at interacting with and helping students, as indicated by student surveys.

My interactions with [Con] have given me several clear impressions about him. First, his character and work ethic are exceptional. He is always prepared, always completes his assignments, and does so with a high level of quality. He is kind, respectful, and carries himself in a way that engenders trust. [Con] is also intellectually curious and a natural deep thinker. I believe that [Con] has excellent potential both as a researcher and a teacher. He is creative and self-motivated, showing a high level of maturity in his academic pursuits. In addition to his undergraduate studies in Bioinformatics at BYU, [Con] has completed two research internships, one at Iowa State and one at the University of Maryland. He has also participated in undergraduate research at BYU. In my opinion, [Con] is exceptionally well prepared for graduate work and has a high probability of success. I have every expectation that he will perform at a high level if you choose to accept him into your distinguished program.

Sincerely,

Ken Rodham, Ph.D.
Assistant Teaching Professor
Computer Science Dept.
Brigham Young University
rodham@cs.byu.edu
801-422-5498

MIT Evaluation for Graduate Admission

Please read instructions carefully before you complete this form.

Return to:

Department of _____
Massachusetts Institute of Technology
77 Massachusetts Avenue, Room _____
Cambridge, MA 02139-4307

Part 1 To be completed by all applicants

Please type or print using black ink.

Important: In the upper right of this form, fill in the return address department name and room number (as indicated on pages 4-16 of this booklet).

Name: Confidential
last/family first middle

Applying for admission in the department of Health Sciences and Technology

for the ultimate degree of Ph.D. area of research MEMP

for the term beginning in September 2008 email Confidential

Under the Family Educational Rights and Privacy Act of 1974, a student enrolled at MIT has access to his or her education records. We intend to comply with both the letter and the spirit of this law, while still allowing the student the option of waiving the right to access. If you wish to waive the right to examine this evaluation at a later date, please sign here.

Applicant's signature: Confidential date _____

Part 2 To be completed by evaluator

An application for admission to MIT requires evaluations from three teachers or people capable of judging the professional and academic promise of the applicant. A separate letter of evaluation may be attached to this form if necessary.

Please return in time for her/him to meet the following deadlines: January 15 for June or September admissions for applicants except as follows: December 15 for Aeronautics and Astronautics, Architecture, Biology, Brain and Cognitive Science, Chemistry, Electrical Engineering and Computer Science, Health Sciences and Technology, Leaders for Manufacturing (see <http://lfm.mit.edu> for additional details), Mechanical Engineering, Media Arts and Sciences; December 15 for Operations Research; December 31 for Biological/Engineering and Political Science; January 1 for Physics and Science, Technology and Society; January 2 for Chemical Engineering, Civil and Environmental Engineering, Economics, Linguistics and Philosophy, Mathematics; January 3 for Urban Studies and Planning; January 5 for Earth, Atmospheric and Planetary Sciences; January 7 for Nuclear Science and Engineering; January 10 for Computation for Design and Optimization, Engineering Systems Division and Technology and Policy Program; and February 15 for Center for Real Estate. November 1 is the deadline for the February term. January 12 and April 6 are the deadlines for Round 1 and Round 2, respectively, for the Master of Engineering in Logistics (MLOG) Program. For the Evaluation Form, please go to <http://www.mit.edu/mlog/>. For the Systems Design and Management Evaluation Form, please go to <http://sdm.mit.edu>.

Evaluator's name: Keith Crandall Title Professor

Address 675 Widtsoe Building Provo Utah 84602 USA

email keith_crandall@byu.edu Date 12-17-2007

School or company Brigham Young University Telephone number 8014223495

In what capacity do you know the applicant? instructor in course; advisor

How long have you known the applicant? 6 months

How does this applicant compare with his or her peer group in academic ability?

- Truly exceptional *equivalent to the very best you have known - a person who, in your experience, appears only every few years* Outstanding *comparable to the best student in a current class* Well above average *top 25%* Above average *demonstrated high ability* Average *able to complete work to the Ph.D.* Below average *lower 50%* Inadequate opportunity to observe

In your opinion, how would this student compare to other students in the graduate program at MIT?

- Truly exceptional Outstanding Well above average Above average Average Below average Inadequate opportunity to observe

Please give the applicant's relative standing in your department (e.g., 7th in 89) don't know

(continue on reverse side)

Personal evaluation of the applicant. What particularly qualifies this student for study at MIT? Information about accomplishments in research or independent projects will be particularly helpful. If you know of other students who have entered MIT from your institution, a comparison will be especially valuable. If you have any reason to believe that the applicant should not be considered, please explain.

December 17, 2007

Massachusetts Institute of Technology

Department of Health Sciences and Technology [HST]

To Whom It May Concern:

I am writing to recommend **Con** to your graduate program in Health Sciences and Technology. I met **Con** this fall as a student in my computational biology class and an advisee in our Bioinformatics program. As you'll see from **Con**'s transcripts, he is simply an outstanding student. Not only has he performed exceptionally well in our rigorous

If the applicant's first language is not English, please evaluate her/his proficiency to read, write, and speak English.

First language is English.

Evaluator's signature Keith Crandall

12-17-2007

Evaluators: Please feel free to add information about your own educational and professional background if you feel that such information will enhance our understanding of your evaluation.

Our bioinformatics major at BYU is now in its fourth year. It is an exceptionally rigorous major and is fairly self selective. I have developed this major with a colleague [Mark Clement] from computer science. My area of research is in evolutionary genomics, bioinformatics, and population genetics. I have served for the past three years as an Associate Editor the journals Evolution and Bioinformatics. I have published over 150 papers, including in Science, Nature, PNAS, Bioinformatics, etc., and have been continuously funded by both NIH and NSF for the 12 years I've been at BYU. Our students get great exposure to top research and come exceptionally prepared to be productive in computational biology without the need for remedial education in biology, computer science, or mathematics/statistics. I urge you to give **Con** your full consideration.

Please seal and sign the envelope.

>> Personal evaluation of the applicant. (Cont.)

major with training in chemistry, computer science, biology, genomics, and statistics, but he has augmented this training with a minor in Portuguese and additional classes in music and physics. Indeed, Con is an exceptionally well-rounded student.

In addition to his formal training, Con has participated in our local bioinformatics research group and he also has taken the initiative to seek external experiences in computational biology. During the summer of 2006, he participated in a summer Bioinformatics and Computational Biology experience at Iowa State University. Again in 2007, Con spent his summer at the University of Maryland, Baltimore County in their summer computational biology program. Thus, Con has had extensive experience in research for an undergraduate, both on and off campus.

While my experience with Con has been limited [due to the timing of his coursework relative to my recent sabbatical leave], I have had the opportunity to have him in class for the entire semester now. That is plenty of time to see that Con shines above a group of extraordinary students. He is clearly one of our best graduates and I do not hesitate in the least to recommend him to your graduate program. I have no doubt that he will excel in graduate work in computational biology. He has exceptional skills and an outstanding intellect and curiosity to couple with those skills. You will be seeing a large number of applications this year from BYU [as you have in the past] and Con is at the top of the applicant pool from our program. I highly recommend to you Con for your graduate program. Please let me know if you have any questions.

Sincerely,

Keith A. Crandall, Ph.D.
Chair & Professor of Biology
Coordinator, Program in Bioinformatics

6 January, 2008

Harvard-MIT Division of Health Sciences & Technology
77 Massachusetts Avenue
Cambridge, MA 02139

Dear Colleagues,

It is my pleasure to recommend Mr. [Con] for the PhD program in Medical Engineering/ Medical Physics at the Harvard-MIT Division of Health Sciences and Technology. My association with [Con] is through an eight week-long intensive summer program for undergraduate research that was held at University of Maryland, Baltimore County in the summer of 2007. The program was sponsored by the National Science Foundation and Gordon was one of the eight students selected after reviewing more than hundred applications from all over the US. I was the faculty advisor for [Con] and three other students who worked on a statistics project related to estimation of false detection rate in important biomedical applications such as gene expression data.

At the beginning of the program I asked the students about their background, their objectives and their expectations from the summer program. My co-director and I also presented several topics to the students in order to find out their preferences in terms of research projects. I could immediately see that [Con] was highly motivated and had good computational and analytical skills. Thus, I did not hesitate to assign him to a project that required significant statistical and computational knowledge. At the end, I was impressed by his achievements. [Con] completed the program with distinction and contributed significantly to the project. He wrote a difficult code for optimizing skew-normal mixture likelihoods via EM algorithm and in the process, he learned several involved statistical concepts such as controlling error rate in multiple hypothesis testing and mixture modeling. Presently, [Con] and his collaborators are preparing a manuscript based on their research findings for submission to a refereed journal. Such a feat is rare among participants of these summer programs. I would put [Con] among the top 5% of the undergraduate mathematics and statistics students that I have seen at University of Maryland, Baltimore County and at Iowa State University.

[Con] has a pleasant personality but he is not afraid to speak his mind. He is honest, matured and responsible. He has excellent written and oral communication skills. I feel that [Con] has all the potential for successfully completing his graduate studies in computational biology and he has a bright career ahead of him. I recommend Mr. [Con] in the strongest possible terms.

Sincerely,

Anindya Roy
Associate Professor
Department of Math & Stat
U. of Maryland, Balt. Co.



GRE

GRADUATE INSTITUTION REPORT OF SCORES

SCHOOL CODE: 3514
DEPT. CODE: 0299

LAST NAME: Confidential
 FIRST NAME:
 ADDRESS:

COPY

BIRTH DATE			SOCIAL SECURITY NUMBER	SEX	MOST RECENTLY REPORTED		PRINT DATE
MO	DAY	YR			TEST DATE	REGISTRATION NUMBER	
Con				M	08/07	5343345	08/31/07

INSTITUTION CODE & NAME	DEPARTMENT CODE & NAME
3514 MASSACHUSETTS INST TECH	0299 COPY FOR BIOLOGICAL SCIENCES - OTHER

GENERAL TEST								ANALYTICAL WRITING/ WRITING ASSESSMENT*			
TEST DATE MMYY	VERBAL		QUANTITATIVE		ANALYTICAL WRITING		ANALYTICAL		TEST DATE MMYY	SCORE	% BELOW
	SCORE	% BELOW	SCORE	% BELOW	SCORE	% BELOW	SCORE	% BELOW			
08/07	620	89	800	94	4.5	54					

NS: No Score. Indicates that no questions were answered in this section.

* Analytical Writing scores earned from the stand-alone administration and/or Writing Assessment scores earned between October 1, 2002, and December 31, 2003.

SUBJECT TEST							
TEST DATE MMYY	TEST NAME	SCORE	% BELOW	SUBSCORE NAME		SCORE	% BELOW