

Master of Biomedical Informatics Capstone Project

Harvard Medical School

Program Director: Nils Gehlenborg, PhD | Program Manager: Rebecca Fitzhugh

The Capstone Experience

A mentored, hands-on capstone experience complements the Master of Biomedical Informatics program, tailored to each student's professional expertise and interests. Our program participants are paired with faculty who are actively bringing quantitative methods and engineering to biomedicine.

Working in collaboration with their mentor, students will participate in Biomedical Informatics research. They gain practical, real-life understanding applying what they are learning in the courses as they work alongside a Biomedical Informatics leader in their area of interest. Typical capstone projects include the development of new methods and tools, creation of data resources, and analyses of biomedical data.

Any correspondence regarding capstone projects, including submission of proposals and reports, must be directed to **Rebecca Fitzhugh** (rebecca_fitzhugh@hms.harvard.edu), MBI Program Manager.

Process

Step 1. Identify Mentor

Students come up with a list of up to 5 potential mentors who have a computational or quantitative research program focused on biomedical data.

- Mentors need to be Assistant Professors, Associate Professors, or Professors. Instructors may act as mentors with permission of the Program Director.
- Mentors need to have an appointment at Harvard.
- Co-mentors such as postdoctoral fellows or other suitable personnel, as well as faculty at other institutions may be proposed as well.

MBI Program Staff is available to introduce students to potential mentors if no previous relationship exists.

Interactions with MBI Program Staff

- Request suggestions for potential mentors.
- Submit list of potential mentors along with email addresses.
- Request introduction to potential mentors if necessary.
- Submit name and contact information of selected mentor.

Deadlines

- Standard MBI + Accelerated MBI Part-time
 - List of potential mentors: February 15th
 - Select final mentor: March 1st
- Accelerated MBI
 - Submit list of potential mentors: September 15th
 - Select final mentor: October 1st

Step 2. Propose Project together with Mentor (also see “Proposal Format” below)

Students develop a project proposal with input from their mentor and co-mentors. Once the mentor has approved the proposal, students submit the proposal to the Program Manager for approval by the Program Director.

Interactions with Mentor

- Discuss project idea, identify data sources, and techniques.
- Discuss how to obtain IRB and other approvals required for proposed project.

Interactions with MBI Program Staff

- Email project proposal *as PDF* to Program Manager. Copy mentor in email to Program Manager.
- Obtain approval for proposed project from Program Director.
- Declare project start date if submitted before deadline listed below.

Deadlines

- Standard MBI + Accelerated MBI Part-time: March 15th
- Accelerated MBI: October 15th

Step 3. Conduct Research under Guidance of Mentor (also see “Progress Report Format” below)

Students conduct research under the guidance of their mentor and co-mentors. Students and mentors meet regularly to discuss the project. Students produce a final report in form of a full-length journal article manuscript.

Interactions with Mentor

- Meet with primary mentor at least once a month to discuss progress, challenges arising in the project, and to address feedback on project reports.
- Obtain signature for progress reports every 6 weeks.
- Agree on a journal that is appropriate for the capstone research.

Interactions with MBI Program Staff

- Submit progress reports *as PDF* approximately every 6 weeks at fixed dates (see below). A progress report has to be submitted at each deadline after the project proposal deadline or the declared start date if that is earlier than the deadline.

Deadlines

- Standard MBI, Accelerated MBI + Accelerated MBI part-time: May 1st, June 15th, October 1st, December 1st, January 15th, March 1st

Step 4. Submit Report (see “Report Format” below)

Students submit a capstone report in form of a full-length journal article manuscript for their targeted journal. The Program Director may request revisions.

Interactions with MBI Program Staff

- Submit report *as PDF* to Program Manager by email, copying mentor and co-mentors.
- Receive feedback from Program Director and other staff that needs to be incorporated into the final report.

Deadlines

- Standard MBI: November 1st
- Accelerated MBI + Accelerated MBI part-time: April 1st

Step 5. Defend Capstone Research

Students present and defend their final and approved report at a “Capstone Research Day” that is open to the public and held once per semester. Presentations are 15 minutes plus 5 minutes for questions.

Deadlines

- Standard MBI: approximately December 1st
- Accelerated MBI + Accelerated MBI part-time: approximately May 1st

Proposal Format

The student must prepare a capstone proposal that is reviewed and approved by their mentor. The student must submit the mentored-approved capstone proposal to the Program Manager for approval by the Program Director. The proposal should be 3 to 5 pages in length and include the following sections:

- Objectives of the research
- State of the art and significance of the project
- Approach and methods
- References
- Timeline
- Plans for submitting an IRB proposal, if relevant. Please include the institute where it was submitted and any policies and dates that may need attention.

Progress Report Format

The student must prepare a capstone progress report every 6 weeks that is reviewed and approved by their mentor. The student must submit the mentor-approved capstone progress report to the MBI Program Manager.

The progress report must outline what has been accomplished so far and detail issues that have been encountered in data collection, analysis, writing, and IRB approval. The report must describe the next steps and explain possible changes to the plan resulting from issues encountered during the project.

The *final* progress report must indicate which journal the student and mentor have selected for the project and a link to the “Instructions for Authors” must be included.

Report Format

The completed capstone paper should be consistent with the requirements of the specific journal to which it could be submitted and will generally include the following sections:

- Introduction
- Methods
- Results
- Discussion
- References
- Acknowledgments

The *mentor must approve the completed written manuscript* in advance of the submission to the Program Manager. It is strongly encouraged that students submit their manuscript to the selected journal.

Timeline

Dates shown here are the latest possible dates. Students may start and complete their capstone projects before the dates shown here. Asterisks (*) indicate approximate dates.

Deadline	Standard MBI	Accelerated MBI	Accelerated MBI (part-time)	Deadline
Sep 1	Start 1 st Year*	Start 1 st Year*	Start 1 st Year*	Sep 1
Sep 15		Submit Mentor Shortlist Select Final Mentor		Sep 15
Oct 15		Submit Project Proposal		Oct 15
Dec 1		Submit Progress Report		Dec 1
Jan 15		Submit Progress Report		Jan 15
Feb 15	Submit Mentor Shortlist		Submit Mentor Shortlist	Feb 15
Mar 1	Select Final Mentor	Submit Progress Report	Select Final Mentor	Mar 1
Mar 15	Submit Project Proposal		Submit Project Proposal	Mar 15
Apr 1		Submit Final Report		Apr 1
May 1	Submit Progress Report	Give Presentation*	Submit Progress Report	May 1
Jun 15	Submit Progress Report		Submit Progress Report	Jun 15
	<i>Summer Break</i>		<i>Summer Break</i>	
Sep 1	Start 2 nd Year*		Start 2 nd Year*	Sep 1
Oct 1	Submit Progress Report		Submit Progress Report	Oct 1
Nov 1	Submit Final Report			Nov 1
Dec 1	Give Presentation*		Submit Progress Report	Dec 1
Jan 15			Submit Progress Report	Jan 15
Mar 1			Submit Progress Report	Mar 1
Apr 1			Submit Final Report	Apr 1
May 1			Give Presentation*	May 1