

## Acknowledgments

This thesis would not have been possible without the encouragement, insight, and guidance of my advisor, Professor Alan Willsky. In my first semester at MIT, he suggested the problems which would eventually be addressed by this thesis, and patiently answered my many questions as I learned about the intricacies of graphical models. As my research progressed, he provided a seemingly limitless supply of new ideas, suggesting connections and interpretations which I would never have made on my own. His thorough revisions of the chapters of this thesis, and willingness to adjust his schedule in order to make these revisions possible, are greatly appreciated.

As the ideas forming this thesis developed, I benefited from innumerable conversations with fellow graduate students. In particular, Martin Wainwright has significantly contributed to the research presented here. We worked together to develop the algorithms which form the core of this thesis, and his initial theoretical results provided a basis for many of my later extensions. He has always been happy to discuss my latest idea or obstacle, and has indelibly shaped my understanding of both statistical inference and Canadians.

Special thanks are also due to Michael Schneider for introducing me to the wide world of numerical linear algebra. Many of the results in this thesis would not have been possible without the references and explanations he provided. In addition, I would like to thank Dewey Tucker and Jason Johnson for patiently listening to me in our weekly grouplet meetings. Each has provided valuable suggestions which have helped clarify my understanding of multiscale and graphical models.

My graduate studies would have been much less enjoyable without the dynamic, supportive work environment provided by the Stochastic Systems Group. I'd especially like to thank my officemates, Alex Ihler and Junmo Kim, for countless interesting conversations. In addition, Taylore Kelly has played an invaluable role in protecting me from the terrors of the MIT bureaucracy. I am grateful that she's just crazy enough to understand me.

The successes I have had in my many years as a student are in large part due