ABSTRACT

Towed video is a commonly used underwater sensor. Spatially registered mosaics produced from video provide a method to integrate video data into Geographic Information Systems for concurrent analysis with other data layers. Video provides a level of spatial resolution one order of magnitude superior to that achieved by acoustic systems, thereby providing the resolution necessary to discriminate targets of potential interest in regions of heavy clutter. Herein a suite of software was written to integrate multiple sensors on a specific towed video system. The software written included data management, time synchronization, re-projection, radiometric enhancement and registration of video imagery. A new practical tool has been developed for operational surveys by the open scientific community.

Dedication

Family is the essence of one’s existence, providing a foundation for growth and development, as well as a validation and legacy of one’s contribution to society. A man does not easily balance his commitment to his family with a pursuit of advanced academic qualification at a university far separated from his home.

I dedicate this work to my children, James and Jessica. I am your past, you are what I hold dear for the future and my incentive to achieve.

To my wife Virginia who has set her career interests secondary to mine and endured many lonely days and nights tending the home fire, I offer this as a token of my love and appreciation of your life-long support, devotion and commitment to all of us.

Acknowledgements

I take this opportunity to acknowledge the patience of my mother and father, had I paid heed to your advice in my youth perhaps I would have achieved a degree a quarter of a century earlier.

Dave Wells and Larry Mayer were fundamental in the establishment of the Ocean Mapping Chair and smoothed my entry to the university. I first met Larry in 1988 at a meeting concerning the creation of a Multi-beam Mapping Program for Canada he expressed his concern that in his experience navies tended to unrealistically limit access to high quality bathymetry. I've kept this in mind and always made a conscious effort to set realistic limits upon data access.

The Bedford Institute of Oceanography (BIO) provides a collegial atmosphere that encourages synergies between various disciplines with interest in Ocean Research and Operations. In 1993 BIO welcomed the establishment of a navy cell in the institute. The cooperative efforts undertaken since then with the Canadian Hydrographic Service and the Geological Survey laid the groundwork of experience for me to commence this work.

The TOWCAM project represents the achievements through synergy that have been the hallmark of BIO over the years. I express my gratitude to Dave McKeown and Don Gordon for their assistance and encouragement, I hope this work is of some benefit to your project.

To my supervisor John Hughes-Clarke, whose assistance, advice and enthusiasm were key to this work, I express my humble thanks for the guidance you provided to this simple sailor.

Table of Contents

List of Figures

List of Tables