

## Vita

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## QFASA R Package

UNIVERSITY OF NEW BRUNSWICK  
REPORT DEFENCE AND EXAMINATION

in Partial Fulfillment  
of the Requirement for the Degree of  
Master of Science

by

**Justin Kamerman**

in the Department of Mathematics & Statistics

U.N.B., Saint John, N.B.

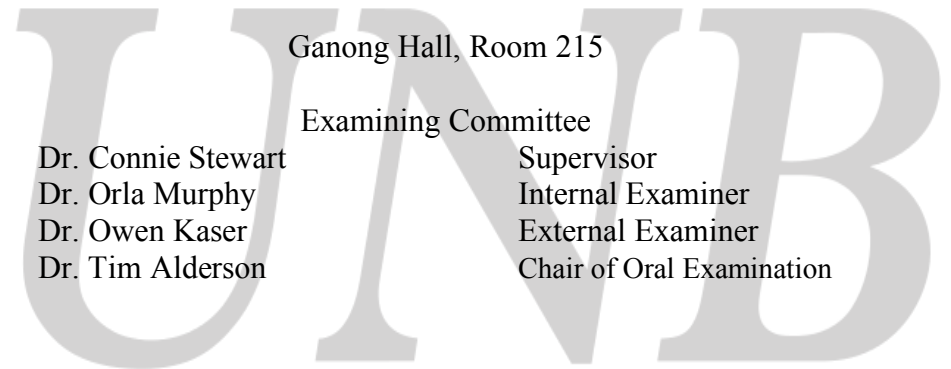
**Tuesday, May 14<sup>th</sup>, 2019**  
**10:00 a.m.**

Ganong Hall, Room 215

Examining Committee

Dr. Connie Stewart  
Dr. Orla Murphy  
Dr. Owen Kaser  
Dr. Tim Alderson

Supervisor  
Internal Examiner  
External Examiner  
Chair of Oral Examination



## Abstract

The primary contribution of this project is to package R source code created to support the fitting and evaluation of Quantitative Fatty Acid Signature Analysis (QFASA) models into a FOSS module available on CRAN. The existing code is widely used by the QFASA community but is inconsistently documented and maintained. This makes it difficult for new users to get up to speed with new and current QFASA methodologies, and to distribute code fixes and improvements.

Creating an R package is a well-defined process and encourages the use of software engineering best practices and the production of well-documented modules that are easy to install and maintain.

This report describes the process of diet estimation via the QFASA methodology and reviews some of the underlying statistical methodologies. We detail the R packaging process and our interaction with CRAN to publish the package, and our implementation of parallel computing methods to improve the

speed and efficiency of model inference by making use of multi-core processors. Finally, for comparison, we review a similar QFASA module, *qfasar*, which was released subsequently.