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**Modeling alpine geomorphology using laser altimetry data**

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## Preface

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Before this thesis begins I first wish to thank a number of people who were of prime importance during my work. Without them I could never have finished this thesis. First of all my co-promotor Harry Seijmonsbergen. Already as a first-year-student in 2002 I was intrigued by his course on landscape analysis where we learned to analyze and answer Earth scientific questions with aerial photos and a stereoscope. Since then he became for me a continuous source of knowledge and enthusiasm, a mentor. During my M.Sc. thesis we already found a connection together with Willem Bouten. Harry the geomorphologist, Willem the modeler, and I acted as intermediate. It worked, and my M.Sc. thesis ended up as a manuscript to be published in the highly rated journal *Geomorphology*. Harry, I am truly grateful having you as my daily supervisor. I've enjoyed our time together in Haus Juliana in Austria and the mobile homes in Luxembourg where we got to know each other also on a more personal level. I've learned a lot from the discussions during field trips in Austria, enjoyed the tooth pain control in the evenings and barbecue sessions in Luxembourg.

The connection between Harry, Willem and me further deepened during my PhD research. I am grateful to my promotor Willem Bouten for his continuous trust and enthusiasm of my work. During frequent discussions with the three of us, Willem always pointed me toward the philosophy of my work by showing connections with artificial intelligence and his work on bird migration analysis, and he forced me to zoom out whenever that was necessary. He always made time for discussions because he enjoyed the work so much. I am grateful that both Harry and Willem always allowed me to work out my own ideas. Of course I also look around to other PhD students and their supervisors, and I know I could not have wished for a better team.

Furthermore, I would like to thank the Research Foundation for Alpine and Subalpine Environments (RFASE), more specifically, Mat de Jong and Leo de Graaff. Through RFASE my work was financed with a grant from the Bristol Stiftung in a project to make an inventory of potential geoconservation sites in Vorarlberg. Also through RFASE I received the LiDAR data set which was kindly provided by the 'Land Vorarlberg'. As my research would not have been possible without RFASE I feel really grateful. I was always intrigued by the amount of knowledge and passion of Leo de Graaff for his work in Vorarlberg. I really enjoyed the excursions which helped me getting more grip on the overall picture of the landscape evolution in the area. And Mat, I enjoyed our time together in the field near Lech and at your home, and you helped me finding the connection between the digital laser imagery and the complexity of the geomorphology in the field.

And thanks to Mike Smith for inviting me to Kingston. We've spent two months together to fine-tune my ideas and algorithms in different landscapes, which opened up my mind that the methods are more generic and not only applicable in the Alps. I'm sure our collaboration will continue in the future, as we've still some stuff to work out in the coming year. And I hope to join you again with the next Luton Marathon Relay!

My work could not have been completed so smoothly without the help of the GIS-Studio. Especially Guido van Reenen, whom I worked with before I started my PhD research, and he helped me with providing good laughs, the latest software, both at home and at the office, and the

fastest computers. Later Thijs de Boer took over his job and continued helping me with all the computational facilities I wished for.

Not the least important, I would also like to thank my roommates in the IBED Spaceship Control Panel, Jurriaan Spaaks, Ivan Soenario, Mike Kemp, Jamie McLaren, Lourens Veen, and later also Wouter Vansteelant. We had good laughs in our office and in the Polder. The discussions during the *writer's club* sessions helped me focusing my thoughts and writing it down.

And Sebastiaan de Vet, with whom I spend some many hours in the train, in the lower section of the last coach of the first train section at 7 am, from Delft towards Amsterdam. His enthusiasm, pace and spirit inspired me, and we became good friends. We even submitted a paper together that is now under revision. And my running mates and best friends Willem-Jan and Marcel helped me to see life is not only about work. The weekly sessions with Marcel playing racket ball, followed by fine cuisine and great wines I will never forget. Life's too short for drinking bad wine!

I could not have finished this thesis without the inexhaustible source of love and support from my family: my parents Ellen and Peter, and my brother Erik and sister Aline. Trying to fit three or four months into one weekend could be exhausting, but nevertheless special, and the shoulder, back, and foot massages from my mother helped me relax and keeping up the spirit. And my father by sharing music that helped me through difficult times. As awkward as our family is, I am proud of where we are and being *Anders*.

But mostly, I have to thank my dear and true love Lieke Mulder. Lieke, you have undergone my ups and downs of the last five years, my grumpiness, my panic, and kept on supporting me even when I was not able to receive it. Your love was crucial in the finalization of my 'project'. I love you. Now it's my turn supporting you to your doctorate degree.