



University
of Victoria

Graduate Studies

Notice of the Final Oral Examination
for the Degree of Doctor of Philosophy

of

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MSc (University of Victoria, 2010)
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“A Minimal of a Subset of the Kari-Culik Tilings”

Department of Mathematics and Statistics

Wednesday August 5, 2015

11:00 A.M.

David Turpin Building
Room A144

Supervisory Committee:

Dr. Anthony Quas, Department of Mathematics and Statistics, University of Victoria (Supervisor)

Dr. Chris Bose, Department of Mathematics and Statistics, UVic (Member)

Dr. Frank Ruskey, Department of Computer Science, UVic (Outside Member)

External Examiner:

Dr. Author Robinson, Department of Mathematics, George Washington University

Chair of Oral Examination:

Dr. Dennis Hore, Department of Chemistry, UVic

Dr. David Capson, Dean, Faculty of Graduate Studies

Abstract

The Kari-Culik tilings are formed from a set of 13 Wang tiles that tile the plane only aperiodically. They are the smallest known set of Wang tiles to do so and are not as well understood as other examples of aperiodic Wang tiles. We show that a certain subset of the Kari-Culik tilings, namely those whose rows can be interpreted as Sturmian sequences (rotation sequences), is minimal. We give a characterization of this space as a skew product as well as explicit bounds on the waiting time between occurrences of $m \times n$ configurations.