A game for the Borel functions
Semmes, B.T.

Citation for published version (APA):
In this thesis, we deal with classes of functions on Baire space. For some important function classes, game representations are known and proved to be very useful. The most prominent example is Wadge’s characterization of the continuous functions that allowed the development of the theory of the Wadge hierarchy; in 2006, based on a result of Jayne and Rogers, Andretta gave a game representation for the $\Delta^1_2$ functions (in the language of this thesis, this is the class $\Lambda^{2,2}_2$). Game characterizations are important as they allow for “Wadge-style proof techniques”. In their paper on Borel functions, Andretta and Martin lament that

“there is no analogue of the Wadge/Lipschitz games for Borel functions, [and] hence many of the standard proofs for the Wadge hierarchy do not generalize in a straightforward way to the Borel set-up.”

This suggested two important questions:

1. Can similar characterizations be given for other function classes, most notably for the class of all Borel functions and the class $\Lambda^{3,3}_3$?

2. Is there an analogue of the Jayne-Rogers theorem at the third level of the Borel hierarchy?

In this thesis, we give positive answers to these questions (Theorems 2.0.9, 5.1.1, and 5.2.8).
Titles in the ILLC Dissertation Series:

ILLC DS-2001-01: Maria Aloni  
Quantification under Conceptual Covers

ILLC DS-2001-02: Alexander van den Bosch  
Rationality in Discovery - a study of Logic, Cognition, Computation and Neuropharmacology

ILLC DS-2001-03: Erik de Haas  
Logics For OO Information Systems: a Semantic Study of Object Orientation from a Categorial Substructural Perspective

ILLC DS-2001-04: Rosalie Iemhoff  
Provability Logic and Admissible Rules

ILLC DS-2001-05: Eva Hoogland  
Definability and Interpolation: Model-theoretic investigations

ILLC DS-2001-06: Ronald de Wolf  
Quantum Computing and Communication Complexity

ILLC DS-2001-07: Katsumi Sasaki  
Logics and Provability

ILLC DS-2001-08: Allard Tamminga  
Belief Dynamics. (Epistemo)logical Investigations

ILLC DS-2001-09: Gwen Kerdiles  
Saying It with Pictures: a Logical Landscape of Conceptual Graphs

ILLC DS-2001-10: Marc Pauly  
Logic for Social Software

ILLC DS-2002-01: Nikos Massios  
Decision-Theoretic Robotic Surveillance

ILLC DS-2002-02: Marco Aiello  
Spatial Reasoning: Theory and Practice

ILLC DS-2002-03: Yuri Engelhardt  
The Language of Graphics

ILLC DS-2002-04: Willem Klaas van Dam  
On Quantum Computation Theory

ILLC DS-2002-05: Rosella Gennari  
Mapping Inferences: Constraint Propagation and Diamond Satisfaction
ILLC DS-2002-06: Ivar Vermeulen  
A Logical Approach to Competition in Industries

ILLC DS-2003-01: Barteld Kooi  
Knowledge, chance, and change

ILLC DS-2003-02: Elisabeth Catherine Brouwer  
Imagining Metaphors: Cognitive Representation in Interpretation and Understanding

ILLC DS-2003-03: Juan Heguiabehere  
Building Logic Toolboxes

ILLC DS-2003-04: Christof Monz  
From Document Retrieval to Question Answering

ILLC DS-2004-01: Hein Philipp Röhrig  
Quantum Query Complexity and Distributed Computing

ILLC DS-2004-02: Sebastian Brand  
Rule-based Constraint Propagation: Theory and Applications

ILLC DS-2004-03: Boudewijn de Bruin  
Explaining Games. On the Logic of Game Theoretic Explanations

ILLC DS-2005-01: Balder David ten Cate  
Model theory for extended modal languages

ILLC DS-2005-02: Willem-Jan van Hoeve  
Operations Research Techniques in Constraint Programming

ILLC DS-2005-03: Rosja Mastop  
What can you do? Imperative mood in Semantic Theory

ILLC DS-2005-04: Anna Pilatova  
A User’s Guide to Proper names: Their Pragmatics and Semantics

ILLC DS-2005-05: Sieuwert van Otterloo  
A Strategic Analysis of Multi-agent Protocols

ILLC DS-2006-01: Troy Lee  
Kolmogorov complexity and formula size lower bounds

ILLC DS-2006-02: Nick Bezhanishvili  
Lattices of intermediate and cylindric modal logics

ILLC DS-2006-03: Clemens Kupke  
Finitary coalgebraic logics
ILLC DS-2006-04: Robert Špalek  
Quantum Algorithms, Lower Bounds, and Time-Space Tradeoffs

ILLC DS-2006-05: Aline Honingh  
The Origin and Well-Formedness of Tonal Pitch Structures

ILLC DS-2006-06: Merlijn Sevenster  
Branches of imperfect information: logic, games, and computation

ILLC DS-2006-07: Marie Nilsenova  
Rises and Falls. Studies in the Semantics and Pragmatics of Intonation

ILLC DS-2006-08: Darko Sarenac  
Products of Topological Modal Logics

ILLC DS-2007-01: Rudi Cilibrasi  
Statistical Inference Through Data Compression

ILLC DS-2007-02: Neta Spiro  
What contributes to the perception of musical phrases in western classical music?

ILLC DS-2007-03: Darrin Hindsill  
It’s a Process and an Event: Perspectives in Event Semantics

ILLC DS-2007-04: Katrin Schulz  
Minimal Models in Semantics and Pragmatics: Free Choice, Exhaustivity, and Conditionals

ILLC DS-2007-05: Yoav Seginer  
Learning Syntactic Structure

ILLC DS-2008-01: Stephanie Wehner  
Cryptography in a Quantum World

ILLC DS-2008-02: Fenrong Liu  
Changing for the Better: Preference Dynamics and Agent Diversity

ILLC DS-2008-03: Olivier Roy  
Thinking before Acting: Intentions, Logic, Rational Choice

ILLC DS-2008-04: Patrick Girard  
Modal Logic for Belief and Preference Change

ILLC DS-2008-05: Erik Rietveld  
Unreflective Action: A Philosophical Contribution to Integrative Neuroscience
ILLC DS-2008-06: Falk Unger  
Noise in Quantum and Classical Computation and Non-locality

ILLC DS-2008-07: Steven de Rooij  
Minimum Description Length Model Selection: Problems and Extensions

ILLC DS-2008-08: Fabrice Nauze  
Modality in Typological Perspective

ILLC DS-2008-09: Floris Roelofsen  
Anaphora Resolved

ILLC DS-2008-10: Marian Counihan  
Looking for logic in all the wrong places: an investigation of language, literacy and logic in reasoning

ILLC DS-2009-01: Jakub Szymanik  
Quantifiers in TIME and SPACE. Computational Complexity of Generalized Quantifiers in Natural Language

ILLC DS-2009-02: Hartmut Fitz  
Neural Syntax