

ELISA PERRONE

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CURRENT POSITION	Massachusetts Institute of Technology , Cambridge, MA USA <i>Erwin Schrödinger Postdoctoral Fellow</i> (Austrian Science Fund) Laboratory for Information & Decision Systems	
RESEARCH INTERESTS	Multivariate statistics, dependence modeling and copulas, algebraic statistics, optimal experimental design, and applied statistics.	
EDUCATION	Johannes Kepler University (JKU Linz) , Linz, Austria Ph.D., Mathematics, April 2016 Dissertation Title: “Optimal design for copula models”. Advisors: Prof. W. G. Müller and Prof. E. P. Klement University of Salento , Lecce, Italy M.S., Mathematics, July 2012 B.S., Mathematics, December 2008	
RESEARCH EXPERIENCE	Massachusetts Institute of Technology , Cambridge, MA USA <i>Postdoctoral Fellow</i> Laboratory for Information & Decision Systems (host Prof. C. Uhler) <ul style="list-style-type: none">• Lead investigator of the project “Geometry of discrete copulas for weather forecasting”; Conducts groundbreaking research among the fields of discrete geometry, statistics and applications	03/2017 - present
	IST Austria , Klosterneuburg, Austria <i>Postdoctoral Associate</i> <i>Student Intern</i> Uhler Group <ul style="list-style-type: none">• Established connections between discrete copulas and polytopes studied in discrete geometry; Identified potential applications of the developed theory to attack weather forecasting problems	05/2016 - 01/2017 09/2015 - 04/2016
	Austrian Center for Weather Forecasting , Vienna, Austria <i>Research Intern</i> Department of weather forecasting models <ul style="list-style-type: none">• Collaborated with meteorologists to conduct evaluation, calibration, and validation of weather forecasting models. Led the application of copula-based methods to weather data	08/2016 - 01/2017
	JKU Linz , Linz, Austria <i>Research and Teaching Assistant</i> <i>Research Assistant</i> Institute of Applied Statistics <ul style="list-style-type: none">• Advanced the state-of-the-art of the optimal experimental design theory to allow for the application of copula models; Supervised on the development of the R package “docopulae”	11/2014 - 08/2015 08/2012 - 10/2014

GRANTS

Austrian Science Fund (FWF)

Erwin Schrödinger Postdoctoral Fellowship, Principal Investigator
Total funded 160.960,00 €

03/2017 - present

PUBLICATIONS

E. Perrone and F. Durante. On testing stochastic monotonicity via discrete copulas. *In preparation*

E. Perrone and C. Uhler. Copula-based approaches to improve the postprocessing of multivariate weather forecasts. *In preparation*

E. Perrone, L.Solus, C. Uhler. Geometry of Discrete Copulas. *Under review*

E. Perrone, A. Rappold, W. G. Müller. D_s -optimality in copula models. *Statistical Methods & Applications*, vol 26, No.3, pp.403–418, (2017).

E. Perrone, W. G. Müller. Optimal designs for copula models. *Statistics: a journal of theoretical and applied statistics*, vol 50, No.4, pp. 917–929, (2016).

F. Durante, E.Perrone. Asymmetric copulas and their application in design of experiments. In: *On Logical, Algebraic and Probabilistic Aspects of Fuzzy Set Theory*. Springer book series "Studies in Fuzziness and Soft Computing", vol 336, pp. 157–172, (2016).

R. Pappadà, E. Perrone, F. Durante, G. Salvadori. Spin-off Extreme Value and Archimedean copulas for estimating the bivariate structural risk. *Stochastic Environmental Research and Risk Assessment*, vol 30, No.1, pp. 327–342, (2015).

E. Perrone. A study of robustness in the optimal design of experiments for copula models. *Stochastic Models, Statistics and Their Applications, Springer Proceedings in Mathematics & Statistics*, vol 122, pp. 335-342, (2015).

G. Salvadori, F. Durante, E. Perrone. Semi-parametric approximation of the Kendalls distribution function and multivariate Return Periods. *Journal de la Société Française de Statistique Special issue on Copulas*, vol 154, No.1, pp. 151–173, (2013).

SELECTED
INVITED TALKS

Geometry of discrete copulas, COMPSTAT 2018, Iasi, Romania, August 31, 2018.

The geometry of discrete copulas, American Mathematical Society Spring Eastern Sectional Meeting, Northeastern University, Boston, USA, April 21, 2018

Discrete copulas for weather forecasting: theoretical and practical aspects, CMStatistics 2017, Senate House, University of London, UK, December 17, 2017.

The geometry of discrete copulas, Seminar on Applied Algebra and Geometry, MIT, USA, October 31, 2017.

Discrete copulas for weather forecasting: theoretical and practical aspects, IFAS Research Seminar, JKU Linz, Austria, October 12, 2018.

Optimal discrimination designs for copula models, CMStatistics 2015, Senate House, University of London, UK, December 12, 2015.

A study on robustness in the optimal design of experiments for copula models, 12th Workshop on Stochastic Models, Statistics and Their Applications, Wroclaw, Poland, February 18, 2015

An approach on design of experiments by using copulas, CMStatistics 2014, University of Pisa, Italy, December 8, 2014.

Stochastic dependence evidences in experimental design for copula models, 19th Young Statisticians Meeting, Basovizza, Italy, October 18, 2014.

OTHER TALKS
AND POSTERS

The geometry of discrete copulas, Workshop on dependence modeling tools for risk management, Centre de Recherches Mathématiques, Montreal, Canada, October 2, 2017.

Geometry of discrete copulas for weather forecasting, Conference on Conditional Independence Structures and Extremes, TU Munich, Germany, October 10, 2016.

Geometry of discrete copulas for weather forecasting, Salzburg Workshop on Dependence Models & Copulas, University of Salzburg, Austria, September 22, 2016.

The polytope of ultramodular discrete copulas, 36th Linz Seminar on Fuzzy Set Theory, Linz, Austria, February 3, 2014.

D_s -optimality for discriminating between copula models: a first example, 30th International Workshop on Statistical Modeling, Linz, Austria, July 9, 2015.

Generalized Frechet bounds: from contingency tables to discrete copulas, Algebraic Statistics 2015, University of Genoa, Italy, June 10, 2015.

A study of the copula parameter impact on optimal design of experiments for copula models, ENBIS 2014, JKU Linz, Austria, September 24, 2014

Optimal designs for copula models, COMPSTAT 2014, University of Geneva, Switzerland, August 19, 2014.

Design of experiments for copula models, Model-Oriented Data Analysis and Optimum Design: MODA 10, Lagow Lubuski, Poland, June 13, 2013.

HONORS AND
AWARDS

Austrian Science Fund (FWF) Erwin Schrödinger Postdoctoral Fellowship
JKU Linz: graduated with distinction
University of Salento: graduated Magna Cum Laude

TEACHING
EXPERIENCE

JKU Linz, Linz, Austria

Statistics for Social sciences and Economics, Instructor

Fall 2014

Duties included shared administrative responsibilities with tutor assistants, grading final exams, and fielding of student inquiries.

Methods for statistical projects, Instructor

Spring 2015

Duties included lectures, office hours, project supervisions, and grading final exams.

OTHER ACTIVITIES *Organization of seminars and conference sessions*

- Fall Seminar on Applied Algebra and Geometry (MIT), co-organized with Elina Robeva
- CMStatistics 2018, organized invited session “Dependence models and copulas”, co-organized with Sebastian Fuchs
- COMPSTAT 2018, organized invited session “Recent development on copula-based models”, co-organized with Fabrizio Durante and Roberta Pappadà

Referee for several statistic journals

Selected list: Computational Statistics & Data Analysis, Scandinavian Journal of Statistics, Statistical Papers, Spatial Statistics, Dependence Modeling, Statistical Methods & Applications

SKILLS

Software: R (expert user), Mathematica (expert user), Polymake (intermediate user), Python (basic user), MATLAB (basic user); Experience with slurm.

Language: Italian (native), English (fluent), German (Intermediate), French (basic).

REFERENCES

Prof. Caroline Uhler
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Prof. Werner G. Müller
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Prof. Fabrizio Durante
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