



Letter from the Editors

Journal of Algebraic Statistics

“The present moment seems a very appropriate one to launch a new journal on Algebraic Statistics”

Fabrizio Catanese, *Editor of the Journal of Algebraic Geometry*

Many classical statistical models, such as Gaussian models from multivariate statistics and models for discrete random variables have algebraic structure in their parameter spaces. Algebraic statistics is a young, vibrant, quickly growing, and active discipline focused on the applications of algebraic geometry and its computational tools in statistical models. It has been applied in disclosure limitation, design of experiments, hypothesis testing for log-linear models, maximum likelihood estimation, and approximations to Bayesian integrals, and in the last decade it finds its applications in several other areas, such as computational biology, chemical networks, and finance. For example, the algebraic approach to phylogenetics is one of the subdisciplines of algebraic statistics, which has seen many applications in computational biology. Besides phylogenetics, this approach has seen biological applications in inferring the progression to drug resistance in HIV, determining the parametric behaviors of sequence alignments, and studying the geometry of fitness landscapes.

Example applications include mathematical modeling, operations research, model identification, system analysis and design, system verification, and system synthesis. Application areas include systems biology, genomics, proteomics, phylogenetics and evolutionary biology, chemical networks, finance, engineering, to name a few. Areas in algebra include polynomial methods, commutative algebra and algebraic geometry, group theory, string rewriting, automated reasoning, automata theory, formal languages, combinatorics, graph theory, and artificial intelligence, among others.

We, the editorial staff, believe this is an important new field, which has the potential to provide immeasurable benefits to all of mankind. However, as with all fields, a common intersection forum is needed. One in which researchers can share their visions, challenges, and victories. A forum which makes it easy for the neophytes - as well as the simply curious - to explore the field, and the experts to discuss how best to help inspire and teach them. Stemming from the mission and great success of the European Journal of Pure

and Applied (EJPAM), we believe we can serve this research community by providing this forum, Journal of Algebraic Statistics (JAlgStat).

It is our great pleasure to invite original research papers and critical survey articles for submission to the Journal of Algebraic Statistics. The JAlgStat is intended to foster communication and interaction between researchers who apply algebraic methods and symbolic computation to various problems in statistics and the life sciences. Algebraists, biologists, statisticians, computer scientists, and scientists who are interested in algebraic methods to solve their problems need to develop a common language to discuss problems of common interest. While several of mathematicians, statisticians, computer scientists, and life scientists involved in this research area already have close collaborations with researchers in other fields, many others do not. Journal of Algebraic Statistics provides a much needed opportunity to further these connections. We will exert every effort to handle submissions swiftly and fairly to provide rapid reviews, taking advantage of the sophisticated electronic infrastructure and facilities provided by the Article Management System.

We all wish Journal of Algebraic Statistics -the first journal in the field- every success in the contemporary scientific world. Please join us in thanking those who have chosen to honor our inaugural issue with their research; with all your help, we can make this a truly valuable research forum.

We are also especially grateful to our all Advisory and Editorial Board members, editorial message senders and all authors who have contributed to this inaugural volume.

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