

Translational AI Center (TrAC) Seminar Spring 2022

Alicia Carriquiry

March 11 at 12:00 noon (US Central Time)

<https://iastate.zoom.us/j/92178103551?pwd=dINCa2I0ckVBTEVyR1JEN2Y3b21XQT09>

Machine Learning in Forensic Applications

Abstract

Much forensic evidence comes in the form of images, which can be blurry, partially observed, and subject to background and other effects. Examples include fingerprints, striations on bullets and cartridge cases, handwriting and many more. Given an image of an item found at the crime scene and a reference image of an item of known provenance, the question of interest is whether the two images may have a common source. In other words, may have suspect's shoe be the source of the shoe print found at the crime scene?

In CSAFE, we rely on algorithms to extract features from images that can be quantified and either used in traditional statistical models or in other algorithmic approaches to estimate the probability that two images may have a common origin. I will show some examples and share information about databases that you can access if you wish to work with this type of data.

Short Bio

Alicia Carriquiry was born in Montevideo, Uruguay. There, she graduated with a degree in Agricultural Engineering in 1982. She enrolled in a MSc degree in animal genetics at the University of Illinois in Urbana, and graduated in 1985. She then moved to Iowa State University in Ames, where she completed a joint PhD in statistics and animal genetics in 1989. Since 1990, Carriquiry has been on the faculty in the Department of Statistics at Iowa State University. She is currently Distinguished Professor of Liberal Arts and Sciences and President's Chair in Statistics, and is Director of the Center for Statistics and Applications in Forensic Evidence (CSAFE), a National Institute of Standards and Technology (NIST) Center of Excellence. She is an elected member of the National Academy of Medicine, a Fellow of the American Statistical Association, the Institute of Mathematical Statistics, the International Society for Bayesian Analysis and the American Association for the Advancement of Science, and an elected member of the International Statistical Institute. In 2021, Carriquiry was awarded the Zellner Medal (ISBA) and the F.N. David Award (Committee of Presidents of Statistical Societies). Her research interests include measurement error modeling, survey sampling and Bayesian methods. In recent years, she has become interested in machine learning algorithms and their application in various disciplines, in particular in forensic science. She has published about 150 peer-reviewed articles and has mentored the work of 20 doctoral students, five post-doctoral researchers, and several brilliant undergraduates.