**Bayes By the Sea Summer School and Conference, 25th August to 1st September**

The second Bayes By the Sea event took place this summer at Univpm, Ancona, Italy. It was generously funded by the European Research Council (ERC) as part of a project led by Barbara Osimani. The event combined a summer school with a conference. Our aims were (1) to advance the interdisciplinary study of Bayesianism and related topics; (2) to foster the use of tools from game theory to investigate strategic behaviour in science. To our delight, these goals were fully achieved.

In the summer school component of Bayes By the Sea, the subjects taught were probability theory (Philip Dawid and Serena Doria) epistemology (William Peden) philosophy of science (Stephan Hartmann and Jan Sprenger) and statistics (Teddy Seidenfeld and Momme von Sydow) all from a Bayesian perspective. There were also classes on epistemic game theory (Andrés Perea and Mantas Radzvilas). The summer school consisted of lectures, tutorials, and exercises/group work. It also included a number of social events: a cocktail party, two bus tours, a boat tour, and a brunch overlooking the stunning Adriatic Sea.

The opening lecture was by Stephan Hartmann (LMU). It outlined some cutting-edge Bayesian philosophy. Hartmann began by discussing Bayesianism’s proven potential as a theory of reasoning. He noted some contemporary challenges, such as how to model discoveries of causal relations or how to incorporate the learning of conditionals into Bayesian updating. Standard Bayesian conditionalisation fails to give guidance in these cases. Hartmann described the “distance-based” approach to updating, whereby one tries to minimise the difference between the prior probabilities and the posterior probabilities according to some measure of distance, as an alternative in such circumstances. There are various arguments different distance measures; the proper choice among them, if it is unique or at least constrained, is an exciting direction for future Bayesian research.

In addition to his two lectures within the summer school, Andrés Perea (Maastricht University) gave two lectures in the conference. The first talk discussed the implications of common belief in rationality for static games with unawareness. Common belief in rationality occurs when all players in a game believe that every other player is rational. Static games with unawareness are those in which some of the choices made by other players are hidden from a given player. Perea formulated a model for such games and a formal procedure for identifying dominant strategies in them.

Teddy Seidenfeld (Carnegie Mellon University) started his lecture by noting that the requirement of finite additivity is often considered to be a weakness of Bruno De Finetti’s theory of probability. In contrast, Seidenfeld considered some of the advantages of this requirement. He showed how assuming finite additivity enables the proof of some powerful theorems in decision theory. He also related these points to the work of Abraham Wald, whose research on these topics was greatly complicated by *not* assuming finite additivity. In short, as Seidenfeld put it, he took the “lemon” of De Finetti’s finite additivity axiom and used it to make “lemonade”.

The short talks brought together researchers from all over the world and across a variety of disciplines. In decision theory, Jimin Kwon (UCSD) examined cautious decision-making and risk-weighted expected utility theory with imprecise probabilities. Stefano Bonzio (Univpm) offered an algebraic and geometrical characterization of De Finetti’s celebrated theorem regarding coherent gambling. Serena Doria (UniCH) investigated the applications of Hausdorff outer measures for defining parts of an interval-valued imprecise credence function.

In formal epistemology, Brett Topey (University of Salzburg) argued that a “planning framework” approach to deciding upon an update rule cannot select a rule other than conditionalization as the most promising update rule, contrary to some recent arguments by philosophers like Miriam Schoenfield. Momme von Sydow (LMU) applied second-order probabilities to the challenging task of modelling beliefs via probabilities. Silvia Milano (University of Oxford) discussed updating by a rule called “ur-prior conditionalization” and argued that, when combined with a constraint on beliefs called “t-independence”, ur-conditionalization is a necessary condition for diachronic coherence. Miriam Bowen (University of Leeds) developed an answer to the Probabilistic Liar Paradox using suspended judgement, a type of imprecise belief. Richard Lohse (University of Konstanz) criticised Richard Pettigrew’s accuracy argument for probabilism. Tamaz Tokhadze (University of Sussex) argued that Timothy Williamson’s E=K thesis is either mistaken or commits us to radical scepticism about induction. William Peden (Univpm/Durham) proposed a solution to the Paradox of the Ravens, via distinguishing “confirmation *simpliciter*” and “predictive confirmation”. Barbara Osimani (Univpm) explained an approach to evidence in terms of strategic signalling, and applied it to the weighting of (1) evidence from a variety of sources versus (2) otherwise comparable evidence from the same source.

There were also talks in social epistemology, economics, and game theory. Liam Kofi Bright (LSE) argued that it is possible for a veritist (who believes that only acquiring true/avoid false beliefs matters for evaluating epistemic practices) to prohibit fraud universally, even though fraud might sometimes be conducive towards true beliefs. Michele Crescenzi (University of Helsinki) expanded models of rational consensus by relaxing the standard assumption that the state space of agreement/disagreement is either a probability space or finite. Giacomo Sillari (Luiss Guido Carli University) investigated how agents can successfully coordinate when there are multiple ways to coordinate action. Oliver Braganza (University of Bonn) examined the economics of proxy measures for outcomes across a wide range of domains; he argued that systems using such proxies will tend towards an equilibrium level of corruption. Pavel Janda (Gdańsk University) explored rational strategies for game players with imperfect recall. Mantas Radzvilas (LMU) used a sender-receiver game-theoretic framework to inquire into optimal lying, and how the incentives for lying can be modified in areas such as pharmaceutical regulation. Nicola Matteucci (Univpm) discussed Italian gambling policy in relation to regulatory capture.

Several common themes emerged across the alks and summer school classes. Many researchers were interested in accuracy-based arguments for Bayesianism. The application of imprecise probabilities in a range of domains was another reoccurring theme. Finally, the work of Italy’s own De Finetti continued to stimulate research: the formal investigation of issues raised by his work is still a reliable source of fresh ideas.

We eagerly look forward to the third Bayes By the Sea in 2020. For more information on our past events, see <https://www.bayesbythesea.com/>. This news report was supported by the ERC, on the project *Philosophy of Pharmacology: Safety, Statistical standards and Evidence Amalgamation* (Grant Agreement ID 639276). For more information on this project, see <https://philpharmblog.wordpress.com/>.

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