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Argument Technology from Philosophy to Phone

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Computational models of argument have vast potential to transform human reasoning and decision-making wherever it occurs taking theories rooted in philosophy, developing algorithms in data science, natural language processing and AI, and engineering solutions that could end up on a phone in everyone's pocket. Fulfilling that potential, however, is enormously challenging. Sometimes, what's required is overhauling our most fundamental theories to accommodate real world phenomena: arguments in the real world, for example, most typically occur in multi-party contexts, so new theories have had to be developed to account for and handle dialogical, dialectical and interactional aspects of argumentation, whilst still supporting formally well-understood phenomena such as abstraction and acceptability, audiences and values, lexical semantics and argument structure.

At other times, though, what's required is forging ahead with a pragmatic compromise at the theoretical level that sacrifices a complete computational account of all facets of argumentation, but which nonetheless helps tackle some specific problem. Applications for supporting argumentation in domains as diverse as law, science and intelligence analysis have adopted this tack, delivering prototypes that demonstrate the potential of argument technology in different sectors.

At yet other times the problem is more a practical one: how on Earth do we assemble datasets of argumentation large enough for training supervised machine learning algorithms (let alone large enough for sheer statistical learning)? Or how can we develop, ab initio, linguistic annotation methods that can keep up with live debate? Right across its broad range of competence, the field of computational models of argument has had to pull itself up by its bootstraps, developing its own working methods, requirements, data standards, software tooling, research challenges and vocabulary.

Then again, sometimes what's required is hard academic slog to drive forward performance: the new field of argument mining is an excellent example where progress is being made in leaps and bounds, even as the challenges are being broadened from domain specific to domain independent, monolingual to multilingual, monological to dialogical. It is the determined inspiration of those working in argument mining that is responsible for results starting to come through that represent acceptable performance on realistic tasks.

But perhaps the greatest challenge, though, is what in commercial terms is known as route to market. How do we get the fruits of our labours into the hands of the hundreds of millions of people who could benefit from it? Whether contributing to the quality of national and international debate, helping the general public identify fake news, improving counterterrorism threat analysis, or enhancing democratic processes or whether nudg-

ing arguments in a pub to be a bit more accurate, helping separating couples reach more acceptable agreements, or offering an elderly parent some advice on the latest Covid rumour: wherever argument plays a role, argument technology has the potential to improve matters. Neither developing new philosophical theory nor building new phone apps (nor anything in between) is enough on its own, but with a clearer game plan for the community as a whole there is an opportunity for us to start to fulfil the potential we have collectively for making a significant difference in the world.