

Judging technology: opportunities and challenges for decision-making in the courtroom

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Societies rightly expect judges to excel at judgement and decision-making. However, in recent years, researchers at the intersection of law and psychology have conducted experiments on practising judges demonstrating that cognitive errors and biases can negatively affect judicial decision-making. To offer some examples, judges sometimes fall foul of hindsight bias (Oeberst & Goekenjan, 2016), confirmation bias (Lidén et al., 2019) and egocentric bias (Guthrie et al., 2000) and are susceptible to anchoring (Englich et al., 2006) and framing effects (Rachlinski et al., 2015) when they crunch the numbers to sentence criminals or award damages. These effects can lead to unjust outcomes for litigants.

As researchers identify and learn more about how cognitive errors and biases can affect judges' decision-making, the next logical step is to devise and implement interventions that can combat their negative effects in courtrooms. Yet, this next phase remains remarkably underdeveloped (Salmanowitz, 2016).

Alongside this research, a new age of judging is emerging, where technological advances, including artificial intelligence, can lead to better and more accurate judicial decisions (Susskind, 2019). These developments can be broken into two main strands: assistive technologies that help human judges improve their decision-making, and technologies driven by artificial intelligence that may replace human judges altogether to decide specific types of cases (or elements of them).

This paper marries the research on judges' cognitive errors and biases with research on courtroom technology. It will consider these new courtroom technologies, and the opportunities and challenges they present to help mitigate, eradicate, or paradoxically amplify judges' cognitive errors and biases.

To take the first strand, how can assistive courtroom technologies best serve to make judges less susceptible to cognitive errors and biases that affect their work? For instance, how might immersive virtual environment technology be used to train judges to combat errors and biases? How might computer programmes draw inspiration from Thaler and Sunstein's choice architecture theory (Thaler & Sunstein, 2009) to structure judges' decision-making, particularly after a courtroom hearing when they deliberate in their chambers? How can big data from court databases be harnessed to inform judges' thinking when making numerical decisions, such as determining sentence lengths, awards of damages, or legal costs?

On the second strand – replacing humans with artificial intelligence judges – might AI judges be able to outperform their human counterparts, and be less susceptible to the frailties of human decision-making (Susskind, 2019)? Or will AI judges only serve to exacerbate errors and biases already at play in present-day courtrooms (Huq, 2018)?

Given the profound consequences of court decisions for litigants, devising and implementing technology-based interventions to mitigate judicial errors and biases is an imperative for future-focused justice systems. Drawing from extant experimental literature demonstrating judicial

cognitive error and bias in courtrooms, and reflecting on embryonic research on how best to combat their negative consequences, this paper will present interdisciplinary and technology-focused proposals for how the business of judging can be improved, leading to better, fairer justice for all.

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