‘Information’ looks at the role information plays in games. When players hold imperfect information game theorists need to keep track of what is known, and when. Playing a game like poker with a minimax strategy is neither profitable nor fun. Success depends on changing what your opponent thinks they know about your hand through bluffing. Hobbes outlined four properties: body, passion, experience, and reason — which give rise to a player’s ‘type’. Rational Analysis assumes that player types are common knowledge, but this is not always so in the real world. A player can signal their type to other players. This generally involves a costly action as a show of strength.

**Introduction**

Luciano Floridi

Information is notorious for coming in many forms and having many meanings. The plethora of different interpretations can be confusing, and complaints about misunderstandings and misuses of the very idea of information are frequently expressed. A theoretical map of the different senses of the term ‘information’ would be most useful. Unfortunately disagreement between scholars affects even the basic starting points of conceptual analysis. Firmly placing these starting points on the map will allow further adjustments and re-orientations in the future.

**4. Semantic Information**

Luciano Floridi

‘Semantic information’ gives a detailed description of several ways of describing semantic information, and outlines problems associated with these methodologies. Unlike the
Mathematical Theory of Communication, semantic information takes the meaning and veracity of information into account. Semantic information can be informative or factual, but the factual kind must always be true. Two main problems affect this theory. The scandal of deduction outlines that as something becomes more probable, it becomes tautological, and therefore less informative. Conversely, the Bar-Hillel-Camp paradox shows that if something is impossible or contradictory, it should be maximally informative.

1. What and why of microeconomics
Avinash Dixit

‘What and why of microeconomics’ explains that microeconomics studies how consumers choose what goods and services to buy, how producers make decisions to meet these demands, and how the two sides interact. Mostly the transactions work fairly smoothly, but occasionally things do go wrong. Sometimes failures are drastic, like the gasoline shortages in the 1970s and the housing bubble and its collapse in the 2000s, so a basic understanding of microeconomics is important. When and how do transactions go well? When and why do they fail? What can be done if they fail? Information and incentive mechanisms to coordinate transactions and how prices work are the main subject matter of microeconomics.

5. Market and policy failures
Avinash Dixit

‘Market and policy failures’ begins with monopolies and oligopolies. What are the effects of monopoly power? Many actions of consumers or firms have beneficial or harmful side-effects such as pollution. These positive or negative externalities depend on whether a market puts the correct price on that action. For a market to function well, the transaction parties must know what they are buying or selling. But there are information asymmetries. The effects of these can be seen through the lens of externalities, and the market failures resulting from these externalities can be remedied by Coasian or Pigouvian methods. Moral hazards, adverse selection, collective goods, the political economy of policy, and the recent financial crisis are also discussed.

1. What is forensic science?
Jim Fraser

‘What is forensic science?’ explains that forensic science is the application of scientific methods to legal problems. This chapter explores the history of forensic science, the role of the forensic scientist, and the various fields of forensic science, including forensics, genetics, and ballistics. It also discusses the ethical considerations involved in forensic science, such as the use of DNA evidence and the treatment of suspects.

Page 2 of 8
date: 20 September 2019
Forensic science is described as the investigation, explanation, and evaluation of events of legal relevance including the identity, origin, and life history of humans, materials, substances, and artefacts. Scientific methodologies are used to describe, infer, and reconstruct events from fragmentary physical evidence and other relevant information. Based on this analysis, forensic scientists answer the central questions in a criminal investigation: who, what, where, when, how, and why? But whilst the science behind forensic analysis is universal, the law is not, and varies widely from country to country. What may be inadmissible evidence in one legal system may secure a conviction in another.

7. Economic Information
Luciano Floridi

'Economic information' explores the value of information in society. Information is different from other commodities — it can be consumed limitless times, it can be shared easily, and reproduced with very little cost. Its value comes from its usefulness. The usefulness of information often depends on its completeness, as the more complete an individual's information is, the better their strategic decisions will be. Being underinformed in a situation (asymmetric information) can lead to moral hazard or adverse selection scenarios. A Bayesian approach can be used to acquire missing information and therefore make better decisions.

8. The Ethics of Information
Luciano Floridi

'The ethics of information' explores the ethical implications of the information revolution. The RPT model states that information can be treated as a resource, a product, or a target. All these usages can give rise to moral dilemmas. However, this model is too simplistic and not inclusive enough. A more suitable approach treats the nature of information ethics ontologically rather than epistemologically. This ecological approach to information ethics focuses on 'being' — simply existing in the universe — rather than 'life'. All agents in the world exist thanks to the existence of other entities, and have a duty to ensure the world's welfare for future agents. This is known as ontic trust.

2. The Language of Information
Luciano Floridi
Information is a conceptual labyrinth, but ‘the language of information’ provides a means to find our bearings on this conceptual map. The information we use in everyday life is comprised of data coupled with a meaning. Information generally consists of different types of data: primary data, secondary data, metadata, operational data, and derivative data. Data does not have to be observed first hand — environmental information is data about one system which has been observed by another. Data with meaning is also known as semantic content, which can either be factual (x is true or false), or instructional (x needs to be performed).

4. Economic information and values in environmental policy decisions

Stephen Smith

‘Economic information and values in environmental policy decisions’ considers the ways in which environmental economists try to capture the value that people place on environmental quality, the quality of life, and other factors affecting judgments on environmental policy. Two key areas are discussed: hedonic pricing, which tries to infer environmental values from observed behaviour in non-environmental markets such as the housing market, and the contingent valuation approach (CVA). CVA values things that do not have market prices by asking people how much they would value having more or less of them. Some examples of where CV has been used include species conservation, environmental damage from pollution accidents, and improvements in air quality.

5. Perception of a 3-D world

Brian Rogers

The ability to perceive the 3-D world has often been regarded as a task that poses particular problems for the visual system. However, ‘Perception of a 3-D world’ argues that we are particularly fortunate because there are multiple sources of information to tell us about the different aspects of the 3-D structure of objects. It discusses three of these sources of information—perspective, occlusion, and shading—and then explains motion parallax, optic flow, binocular stereopsis, eye vergence and depth constancy, vertical disparities and differential perspective, and primary and secondary depth cues. The effectiveness of these different sources of 3-D information is considered along with how they are all brought together.
6. Risk communication
Baruch Fischhoff and John Kadvany

‘Risk communication’ shows how risks are communicated between parties in society, and how effective risk communication is essential to society. Risk communications affect individuals' ability to make choices and reflect their place in society. They can be judged both technically, by their effectiveness at actually conveying information and their estimation of the public’s ability to comprehend complex information, and socially, by how they embody the social contract in society, which values respectful, bilateral involvement throughout the communication process. Poor risk communications can lead to poor decisions made by members of society, and the erosion of public trust in organisations.

7. The chemical computer: molecular information
Philip Ball

‘The chemical computer: molecular information’ outlines the ways that molecules can store and transmit information. Genetics is living proof that complex information can be encoded through systems using molecular recognition. Genetic systems have a vast array of copying, proof–reading and editing tools available to them to prevent errors when replicating, transcribing and translating data (although occasional errors — mutations — are essential for evolutionary progress). These tools can be commandeered by scientists to manipulate the genome. Moore's law states that computer power will double every two years. New technologies, such as genetic and molecular computers, are needed to ensure this law holds true.

6. Hacks vs flaks: journalism and public relations
Ian Hargreaves

Journalists often get a bad press, being portrayed as crusaders, single-minded, and determined above all else to get the information they desire. ‘Hacks vs flaks: journalism and public relations’ considers the motivations of journalists, their public image, and asks in whose interest the journalist works: for the interest of an employer or for a wider ‘public good’? The answer may be both, but in the event of a clash, which interest takes priority? The roles of public relations practitioners, intermediaries, and spin doctors are discussed.
Traditional public relations techniques of media management are no longer effective in a world of resource-depleted mainstream journalism and uncontrollable social media.

7. What works?
Avinash Dixit

Given the long list of defects in markets and governments outlined in this VSI, the world has not fared too badly. ‘What works?’ concludes that a mixed economy — where competitive markets or similar institutions generate information about scarcity and create incentives to alleviate the scarcity in a reasonably efficient manner, where antitrust policies keep the markets open to competition, where the government and other social organizations help overcome the inefficiencies of externalities, and where political competition acts as a corrective mechanism against abuses of power and serious errors of judgement — is the best way of organizing microeconomic activity.

6. Prints and marks: more ways to identify people and things
Jim Fraser

‘Prints and marks: more ways to identify people and things’ outlines the examinations and evaluation of marks evidence (such as fingerprints and shoe marks). Marks evidence can often be 100% conclusive, making it a very useful tool. Fingerprints have been used in forensics for over 100 years, and rapid analysis of fingerprints is possible due to computerized databases. Shoe marks can link a particular shoe to a crime scene, but also provide information about the nature of the crime. Marks evidence has been criticized for being assessed categorically rather than through statistical means. It is also susceptible to confirmation bias.

Forensic Science: A Very Short Introduction
Jim Fraser

Forensic Science: A Very Short Introduction introduces the concept of forensic science and explains how it is used in the investigation of crime. In forensic science, a criminal case can often hinge on a piece of evidence such as a hair, a blood trace, half a footprint, or a tyre mark. High profile cases have attracted enormous media attention and enhanced this interest in recent years. However, the public understanding of forensic science is poor, and largely
based on TV shows. This VSI explains the principles of crime scene management, explores how forensic scientists work, and considers the techniques they use.

6. Working with law enforcement
David Canter

‘Working with law enforcement’ shows that forensic psychologists contribute to all stages of the investigative process. They help to set up effective systems for collecting and making sense of all the information needed during an inquiry. This includes detailed consideration of the crucial processes of interviewing witnesses, victims, or suspects. The new area of investigative psychology covers ways of improving the quality of testimony, including approaches to the detection of deception, methods of managing police data, linking crimes to a common offender, offender profiling, as well as a broad range of inputs to the management of police enquiries.

5. Physical Information
Luciano Floridi

‘Physical information’ explores the relationship between physics and metaphysics with regards to the nature of information. Information theory and processes seem to have physical properties, so much so that the laws of thermodynamics can be applied to information transfer. This rules out the creation of perpetual motion machines using information management systems to control the particles within, as certain information processes will lose energy and ‘pay the bill’. However, a quantum computer could theoretically have the power to circumvent these processes. If built, the findings from these computers could eventually prove that all matter is actually information.

7. Always the bridesmaid?
David Canter

‘Always the bridesmaid?’ considers the future for forensic psychology. Until recently, forensic psychologists were seen as providing a supporting role, but there is now increasing professionalization of forensic psychology, which is able to draw on the full range of psychological and behavioural sciences. The impact of a scientific psychology, with its standardized tests and experimental methods, developing theories and objective procedures,
has been significant. There is great potential for the expansion of forensic psychology; psychological experts are finding their way into family courts and civil proceedings, rather than just working in criminal courts. There is also room for more psychological discussion of crime prevention and increased work with offenders outside the prison system.