



Ethical issues in tracking cellular telephones at an event

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ABSTRACT

Early in 2007, the CSIR conducted an experiment to track the cellular telephones of a small group of people as they moved to and from an event, to test the viability of using such tracking to provide the participants with useful traffic information. This project raised a number of ethical issues, which prompted this paper and which we discuss here. These include:

- the ethics of modelling data, including the treatment of research participants;
- privacy and surveillance issues related to tracking the movement of people;
- the risks inherent in being tracked vs the benefits of being tracked; and
- the ethics related to sending messages to drivers.

We have reviewed the literature on ethics and used the results to assemble a check list of relevant ethical issues, adding a few of our own (i.e. a deontological ethics approach), against which the conduct of this research project was assessed. We also provide an overview of the experiment and the results obtained.

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1. Introduction

Early in 2007, the CSIR conducted an experiment to track the cellular telephones (cell phones) of a small group of people as they moved to and from an event, to test the viability of using such tracking to provide the participants with useful traffic information. This project raised a number of ethical issues, which prompted this paper. We have conducted a survey of the relevant literature on the ethics of modelling and of surveillance. From these, we have assembled several tables that could be used as “check lists” for assessing the ethics of an operational research projects in general, and of surveillance projects in particular. We then describe our project and assess it against these check lists. Of course, check lists are not necessarily required for a project

to be executed ethically and they alone cannot guarantee that a project will be executed ethically, but they can give one peace of mind that one is probably doing the correct thing. We hope that this paper contributes towards an understanding of good practice in operational research (OR).

2. Brief survey of the relevant literature

2.1. Ethics of modelling—a review

The use of mathematical models to support decision making is proliferating in both the public and private sectors. Advances in computer technology and greater opportunities to learn the appropriate techniques are extending modelling capabilities to more and more people.

As powerful decision aids, models can be either beneficial or harmful. At present, few safeguards exist to prevent model builders or users from deliberately, carelessly, or recklessly manipulating data to further their own ends. Perhaps more important, few people understand or appreciate that harm can be caused when builders or

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users fail to recognise the values and assumptions on which a model is based, or fail to take into account all the groups who would be affected by a model's results [1].

The above was the driving force behind a workshop on "Ethics in Modelling" held in 1989. Much of what was behind this workshop still holds today. In fact, the situation is possibly more complex today, especially with the almost exponential growth in computer technology and in the availability of sophisticated software. Today, much more so than in the past, people, and especially non-experts, have access to this technology, giving them the ability to build models and to make them increasingly complex.

Ethics, from the Greek word *ἦθος* (*ēthos*) meaning custom or habit, is a branch of philosophy concerned with the nature of ultimate value and the standards by which human actions can be judged right or wrong. The term is also applied to any system or theory of moral values or principles. Ethics is traditionally subdivided into *normative ethics*, *metaethics* and *applied ethics*. Normative ethics seeks to establish norms or standards of conduct (the study of how to determine ethical values). Metaethics is concerned with the nature of ethical judgments and theories (the study of the concept of ethics). Applied ethics consists of the application of normative ethical theories to practical moral problems (the study of the use of ethical values) [2].

Metaethics falls outside the scope of this article because we are not developing any new theory of ethics. Similarly, although the entire exercise is one of applied ethics, an attempt to apply ethics theory to a real-life situation, the focus in this review is on normative ethics.

There are three major approaches in normative ethics, *virtue ethics*, *deontological ethics* and *consequentialism*. Virtue ethics emphasises virtues or moral character; Aristotle is a pioneer virtue ethicist. Deontological ethics emphasises duties or rules; Immanuel Kant set out a framework for a deontological normative ethical theory. Consequentialism emphasises the consequences of actions; John Stuart Mill set out a framework for classical utilitarian normative ethics, the simplest form of consequentialism. Suppose it is obvious that someone in need should be helped. A consequentialist will point to the fact that the consequences of doing so will maximise well-being, a deontologist to the fact that, in doing so the agent will be acting in accordance with a moral rule such as "Do unto others as you would be done by" and a virtue ethicist to the fact that helping the person would be charitable or benevolent [3].

In referring to Slote [4], Walker [5] states that unethical behaviour means consciously doing something you know, or society says, should not be done and that these behaviours include deception, bias, lying, falsification, distortion and withholding information. Many of the issues that are being addressed when modellers talk about ethics are not necessarily ethical questions but rather questions concerning good practice. By following good practice one attempts to minimise unethical behaviour or promotes ethical behaviour.

The growth in the availability of quantitative data, the use thereof, and the complexity and significance of models

raises many ethical questions such as [6]:

- What is the proper relationship between the model builder and the model user?
- Should model builders assume professional responsibility for the results of their model?
- Do model builders have a responsibility to those affected by the results of their models besides their clients?

Walker [7] discusses the role of the modeller vis-à-vis the decision maker and describes the tenets of "good practice" in model building. He does this in the context of the policy analyst but what is outlined is as applicable to modellers. This is done according to the stages in the process of building models. For each stage the responsible and prudent behaviour that should be expected from the modeller is described. Gass [8] gives his views on "ethical concerns and ethical answers" and feels quite strongly that a code of ethics is required for modellers. He does state, however, that through experience he "just knew what was right and what was wrong" specifically when it concerned ethics. Gass [9] describes efforts by OR societies to establish such guidelines and notes that there is a reluctance to the adoption of such guidelines. In analysing rational-style model-based policy analysis, Walker [5] takes this further, arguing that following the tenets of good practice is necessary, and generally sufficient, to ensure ethical conduct.

There is very little literature on ethics in modelling or, for that matter, on ethics in Operational Research/Management Science (OR/MS). Interest has grown over the last 10 years and a few papers have been published on this topic (for example [10–13]), while a working group on ethics was established within EURO (the European Operational Research fraternity). Gallo [12] proposes two ethical principles that can assist Operational Researchers and practitioners, namely the *responsibility principle* and the *sharing and cooperation principle*. The first principle calls for the Operational Researcher to take into account not only the point of view of the client but in fact that of all stakeholders—i.e. all those affected, directly or indirectly, by the results of their activities. Müller-Merbach [14] is explicit in considering *ethical action* to be part of the responsibility principle for Operational Researchers. The second principle, in turn, calls for a more open distribution of research results and activities.

2.2. Ethical transgressions in research

There have been many attempts throughout the world to define research misconduct and associated ethical transgressions which led to much controversy. As the White Paper on Promoting Integrity in Scientific Journal Publications of the Council of Science Editors (CSE), Reston, VA, USA puts it:

Unfortunately, a single definition of scientific misconduct does not exist in the scientific community, although most definitions include falsification, fabrication, and plagiarism. This multiplicity of definitions can be explained in part by the multiple national bodies within a country that may be attempting to address the problem. Further, in

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