I have been a practitioner in the field of robotics for over 20 years, and during that time I developed a strong appreciation for the potential ramifications of the research that I have been and currently am conducting, ranging from the pure science to the more applied. This has led me to delve deeply into the questions surrounding the ethical practice of robotics as a whole and to seek out both the means for analysis of the consequences of my personal actions in the field (past, present, and future) while also actively encouraging my colleagues to do so as well.

There are all sorts of red flags being raised by others regarding the perils of robotics, all the way from a predicted end of the human-dominated world due to self-replicating robots (e.g., [1,2]) to far more immediate issues surrounding the application of robotics (e.g., the use of robots in warfare, labor ramifications, and the deliberate psychological manipulation of human beings by robot entities). While I could also take a stand on the more alarmist perspectives, I will in this talk, address those concerns arising from the here-and-now practice of robotics from a personal perspective, most of which have serious short-term ethical consequences. While some of these issues have been discussed in prior Roboethics conferences in a more general informative manner, they have not been developed in the context of an individual researcher’s perspective nor, oddly enough, in a true ethical context, where different theories of ethical reasoning are applied, whether they be utilitarian, cultural relativism, social contract theory, Kantian, etc.

Independent of the specific personal ethical framework for analysis chosen, I will lay in front of you three ethical quandaries that are not hypothetical but the reality that I have been or am currently confronted with. In teaching my class on robot ethics (CS 4002 Robots and Society) I encourage my students to examine not only abstract or removed case studies but also current practices such as my own in light of the criticisms they may well be subjected to within society. I find this exercise invaluable personally as well, as it informs me, often in surprising ways regarding the views that at least one segment of the population holds regarding this research.

One major research area I am responsible for involves military robotics. While I choose to only conduct unclassified research so that I can publish and talk to you freely about it (at least to date), my experience in this area ranges from issues such as robots for explosive ordnance disposal and demining to the development of software for autonomous weapons-bearing unmanned vehicle systems (e.g., DARPA’s Unmanned Ground Combat Program). The controversy surrounding this is clearly evident, ranging from the traditional arguments against warfare in general and new weapon construction in particular, to issues surrounding the direct application of lethality by autonomous systems without having a human in direct control or issuing a confirmation of an order to kill. Ongoing research on my part for the U.S. Army involves assaying opinion (of the public,
researchers, the military, and policymakers) on the use of this latter class of autonomous robots, while also investigating how to embed artificial consciences in these vehicles to ensure that the international laws of war, codes of conduct, and rules of engagement are strictly followed by machines, perhaps even more effectively than by humans.

The second area of controversy deals with personal robotics. I have served as a consultant for Sony Corporation for nearly 10 years in the development of software for AIBO and QRIO robots (entertainment robots). While most view this as an innocuous and even beneficial use of robotics, possibly for the treatment of isolated elderly people, not all agree [3]. This research requires a deep understanding of not only a robot’s capabilities but also human psychology, where the roboticist’s deliberate goal is to induce pleasant psychological states in the observer through specialized patterns of robot behavior and, to the greatest extent possible, suspend observer disbelief that this robot is not alive with the goal being to establish a long-term, even lifelong, human-robot relationship. Some view this type of research as no different than that of cinema, video games, or other forms of entertainment. Others such as [3] argue that this is an intrusion into the rights of the elderly to remain in contact with the real world, while society (and researchers such as myself) makes excuses for its intended unethical use.

The final area that I am concerned with is the displacement of workers, in areas such as shipyards. Although I do not actively have current research in this area, I am currently considering and willing to undertake it, which in many respects has caused me more soul-searching than the other two examples cited above. This research avenue can undoubtedly lead to a clash between an act utilitarian perspective of a large corporation with the individual worker’s (Kantian) right to good will. When a roboticist can project the consequences of their research as ultimately leading to significant unemployment with world-wide impact, and while being unable to directly influence social support structures for these potentially unemployed, what is their moral responsibility here? This may lead to a more traditional debate on industrial revolutions in general, but nonetheless roboticists often are woefully unaware of where the consequences of their work may lead in this domain.

These issues are personal day-to-day concerns, and I contend should also be part of a regular professional roboticist’s diet. As in many ethical areas, we will not agree universally on the outcomes for these and other related issues, at least from an individual perspective. Nonetheless, I argue that it is a central responsibility of a roboticist to conduct such self-examinations to ensure that he/she is aware, at least consistent with their own morality, the consequences of their actions and also to be prepared to become engaged with others in this field so that we as a group of concerned scientists can develop acceptable limits and guidelines to a broad range of emerging robotics issues.