

# **Computer Scientists – The New Professionals**

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The term 'professional', and the rights and practices associated with it, is commonly used to label groups such as engineers, doctors and lawyers. Computer scientists carry responsibility equal to doctors, lawyers, or engineers, yet do not benefit from the advantages of being considered professionals. With the ever growing importance that computers have in our society and individual lives, the computer scientists responsible for maintaining them should hold a level of prestige equal to their calling. Computer scientists should be considered professionals.

Being considered a professional is more than just an implicit label assigned to certain types of occupations. "In order to achieve status and monopolistic position in the market for services of some kind, aspiring professionals are seen to stress the distinctness of their knowledge, the undoubted authenticity of their altruism and the responsibility of their members." (Malin, 2000, p. 25) A professional's "monopolistic position" is not just the result of certain education; it is submission, on an individual level, to a more general collection of procedures and practices. In short, professionals are stewards over their occupational domains, performing their tasks, interacting with their clients and each other, in exactly the ways they understand to be the most beneficial.

The issue of ethics provides us with a good place to begin our discussion of professionalism in computer science. It is interesting to note that ethical considerations and codes, of some form or another, can be found in almost all groups considering themselves to be professionals, be they lawyers, engineers, or otherwise. Evidence of this can easily be seen in the strength of organizations such as *the Institute of Electrical and Electronics Engineers*, more commonly referred to as the IEEE, an organization that holds a code of ethics at its core. If computer scientists are to be considered professionals, it would seem reasonable to assume that they should also follow ethical guidelines.

The term "ethics" has been subject to many definitions, an obfuscation that is no doubt the result of repeated misuse and misinterpretation. In the context of our discussion, a rigorous attempt to properly define (if possible) the term "ethics" would be fruitless. For our use, it will be sufficient to define "ethics" as a set of principles, often moral in nature, that govern the actions of an entity (for example, an individual or group). It is important to note that the key word in the previous statement is "actions". Ethics does not just consider what an entity simply believes to be right or wrong, but rather what an entity believes to be correct or incorrect behavior in the context of interactions with other entities.

The personal safety of those served by professionals, or those who use products created by professionals, is a very common ethical consideration of many professional groups. In our quest for evidence demonstrating the need for ethical codes in computer science, we can start by comparing ethical safety issues faced by computer scientists to similar issues faced by other professionals. As our first example, imagine a team of professional engineers assigned to build a bridge in a city. Obviously, the bridge must be built with the safety of those who will use it in mind, lest many lives could be lost. It is in the city's best interest to hire professional engineers that follow an ethical code promoting the safety of those who will use the bridge. In this example, the

fact that the engineers followed such an ethical code helped them better serve the city.

When we compare these engineers to a team of computer scientists creating software to control a nuclear reactor in a flourishing populous, a blatant similarity arises. Like the situation faced by the engineers, the safety of many people rests on the safety considerations applied to the computer scientists' product. In the same way that the engineers benefited from following ethical guidelines promoting user safety, the computer scientists may also benefit.

Some people may attempt to argue that our nuclear reactor example does not provide sufficient justification in favor of ethical safety guidelines in computer science. After all, very few computer scientists will ever get to work on something as potentially dangerous as a nuclear reactor. This is a dangerous assumption to make, because the fact of that matter is that "it is increasingly common to use programmable computers in applications where their failure could result in extensive damage." (Bowyer, 2001, p. 187) In our day and age, computer technology is all around us, it's in the cars we drive, and it's in the elevators we ride between floors. The potential dangers are very real, and certainly not limited to nuclear reactors. To best serve their users, computer scientists certainly need to be considering safety issues.

Our case in favor of ethical guidelines regarding safety issues in computer science can be furthered with a discussion of safety itself. Ridiculous exceptions aside, personal safety is something we can safely assume is desired by all humans. Simple evidence of this can be seen in our essentially universal belief that assault and murder (holding cases such as euthanasia at a distance) is wrong. Since all people desire personal safety, the act of computer scientists following ethical guidelines to ensure the personal safety of those they serve could only be well received.

Through our discussion of safety, we have come to recognize the need for our first group of ethical guidelines in the computer science field, and have identified similarities between computer scientists and other professionals. Ethical considerations are however much deeper than safety ethics, so for now, let's add our "safety ethics" to a metaphorical toolbox. Subsequent discussions will continue to fill our toolbox, and we will begin to recognize more and more the tremendous similarities between computer scientists and other professionals.

The issue of privacy is another ethical topic of great relevance to computer scientists. To recognize the importance of privacy issues, we note that "there is a strong connection between our ability to control who has access to us and to information about us, and our ability to create and maintain different sorts of social relationships with different people" (Rachels, 1975). "Recognition of an individual's right to his or her inviolate personality is comparable to being respected as autonomous being." (Johnson, 1985, p. 64) If the privacy of an individual or group is compromised, there exists a potential for tremendous loss.

Medical professionals can provide us with an excellent example that details the importance of privacy. Let us consider a group of people secretly living with an arbitrary socially stigmatized disease. Clearly, it is important for their doctor(s) to be aware of the disease in order to render proper medical attention. But, if this information was carelessly distributed to the public,

horrendous damages could result. The diseased group could experience a loss of social status, a loss of credibility, as well as other damages resulting from being labeled as deviants against societal norms. To avoid such an occurrence, medical professionals follow ethical codes designed to protect the privacy of their clients, safeguarding "patient confidences and privacy within the constraints of the law" (American Medical Association, 2001).

If we consider the ethical dilemma of privacy as it relates to computer scientists, we can imagine the potential for even greater damages. By their very nature, computers are essentially unmatched at storing and transmitting large volumes of information with relative ease. If this information happens to be of a sensitive nature, the potential for misuse is substantial. Whereas a doctor might carelessly release sensitive details about a few patients, a computer system could be used to rapidly distribute private information about millions of individuals.

It would be careless to assume that privacy issues are outside the realm of concern for computer scientists, as many "kinds of...information by its very nature must be handled confidentially" (Parker, 1979, p. 97). Even though computer scientists are not necessarily involved in the creation of privacy laws, or their enforcement, they do still play an important role. While constructing a privacy-sensitive computer system, a computer scientist project team is in a position of tremendous power. Those requiring the system may not be aware of the privacy risks present in computer systems; therefore, there exists a need for the project team to discover the privacy concerns inherent in their design, and use their exclusive expertise to create protection against potential privacy compromises.

We have demonstrated a clear need for computer scientists to provide their clients with accurate advice regarding privacy concerns. This goal could most effectively be accomplished if computer scientists followed ethical codes detailing how to properly handle privacy concerns. Such privacy ethics will fit very well into our ethical toolbox. Together with our decision to use ethical guidelines for handling safety issues, the need for privacy ethics further strengthens the similarities between computer scientists and other professionals.

Our discussion of privacy has also brought another interesting issue to the surface, the obligation computer scientists have to provide accurate and timely advice to their clients. Other professions, such as engineering and medicine, very willingly provide us with examples of this concept. It is clearly necessary for an engineer to advise his client on the appropriate building materials needed to complete a project. Likewise, doctors will always take special care to provide advice to their clients on how to improve their health. Such advice is very helpful, and allows professionals to provide a better service to their clients.

There is certainly a need for trained computer scientists to be providing such advice. This need stems from the plainly visible fact that a large majority of people are not very knowledgeable about computers. For example, clients seeking a new software system may have an idea of what function they want their system to perform, but they will almost always need advice from computer scientists on details such as implementation, infrastructure, and methods (to name a few). This advice is important, it makes a difference, and computer scientists are the most

qualified to provide such advice.

It is reasonable to assume that the concept of providing advice to clients could also be included into a set of ethics for computer scientists. Recall that we previously defined ethics as “what an entity believes to be correct or incorrect behavior in the context of interactions with other entities”. Therefore, if computer scientists formalized their obligation to provide advice to clients, we have yet another ethical concept to add to our ethics toolbox.

One might argue though, that advice from computer scientists is difficult to take seriously if there is no guarantee that the advice is provided with an attitude of honesty. Computer scientists should provide advice, but as an added protection to the client, the advice must always be provided in an honest fashion. Interestingly, the concept of honesty can be found in many professional ethical codes, such as the IEEE code, which encourages its followers “to be honest and realistic” (IEEE, 1990). If computer scientists are to consider themselves professionals, it seems logical that our ethical toolbox would not be complete without ethical guidelines supporting honesty.

Our discussion of some of the ethical considerations of importance in the computer science field has certainly strengthened our case in favor of considering computer scientists to be professionals. Although we could easily continue to pick apart the ethics needed in the computer science field, there are other important topics to discuss. Professionalism is more than just ethics, it also suggests a certain hegemony of its members over others. If computer scientists are to be considered professionals, we must define what can provide them with this hegemony.

A logical place to start is to define exactly what makes a person a computer scientist. One possible way to formalize such a definition would be to demand that people possess certain qualifications before they can act the part of a computer scientist. If we look again at existing professional occupations, we can readily extract an example of this intrinsic need for qualifications. In the world of professional medicine, people claiming to be medical doctors would certainly not be allowed to practice without first demonstrating that they have the appropriate qualifications. Since computer scientists carry similar responsibilities, as previously discussed, it seems appropriate that there should be qualification verifications done on people claiming to be computer scientists.

For our use, let us just assume that a computer scientist should most definitely have a bachelor's degree from a recognized university. It is outside the scope of our discussion to probe any further for more specific qualifications, we need only a very general definition. Note that even with our general definition, we have already prevented a large number of those currently functioning in computer-related occupations from considering themselves to be professional computer scientists. At first glance, this may seem cruel, but in fact, such an action would give computer scientists a more distinguished role in society. With further inspection, we will come to understand that the exclusion of those people who do not meet our general qualifications is very necessary.

It is here that we discover the next vital element of professionalism, a separation of the

profession from similar occupations. This separation allows a profession more power to perform its duties in the way it knows to be correct, and to do so unquestioned. This power stems directly from the profession's ability to vouch for the qualifications of its members.

If computer scientists were professionals, their ability to practice their profession unquestioned would in fact be beneficial to everyone. Clients of computer scientists could reasonably expect their requests to be filled in the best possible way. Businesses employing computer scientists, in essence, would be offering a higher quality product. Lastly, and certainly most important, computer scientists would be benefiting one another as they collectively buoyed up the reputation of their profession.

It is inside this boost of reputation that we find our final point in favor of professional computer scientists. Professions are, by their very nature, altruistic to both their members and the people they serve. Professional computer scientists would be "appropriating a field as" their "exclusive area of jurisdiction and expertise", and "making...this field into a legitimate area of knowledge of and intervention on the world." (Malin, p. 69) Computer scientists would enjoy the benefits of greater credibility and a higher level of occupational prestige if they were considered professionals. The existence of a profession in computer science guarantees to produce much finer results for those it serves.

The sum of our discussion has led us to decide that computer scientists should most definitely be recognized as professionals, stewards over their occupational domain. The benefits of considering ethical responsibilities in computer science have been made very clear. Carrying out these ethical responsibilities involves providing accurate advice, which should be done in an honest fashion, and only by those who are qualified.

Under these premises, professional computer scientists would enjoy a higher degree of separation from similar occupations, allowing them to operate in an environment of higher credibility, trust, and respect. Recognition of computer science as a profession promises to boost its members to a hegemonic level, allowing professional computer scientists the power to provide the world with the very best they have to offer, and to deliver it using methods they understand to be best.

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