

5 Professionalism

This discussion is with respect to the paper titled “Contextualizing Professionalism in Capstone Projects Using the IDEALS Professional Responsibility Assessment”, *International Journal of Engineering Education* Vol. 28, No. 2, pp. 416–424, 2012

5.1 AREAS OF RESPONSIBILITY

Pick one of IEEE, ACM, or SE code of ethics. Add a column to Table 1 from the paper corresponding to the society-specific code of ethics selected above. State how it addresses each of the areas of seven professional responsibilities in the table. Briefly describe each entry added to the table in your own words. How does the IEEE, ACM, or SE code of ethics differ from the NSPE version for each area?

1. Work Competence
 - a. “2.2 Acquire and maintain professional competence”
 - i. “A professional must participate in setting standards for appropriate levels of competence, and strive to achieve those standards. Upgrading technical knowledge and competence can be achieved in several ways: doing independent study; attending seminars, conferences, or courses; and being involved in professional organizations.”
 - b. Keep yourself up to date with modern standards by actively learning something new to maintain professional competence. This is done on an individual level as a responsibility to stay professional.
 - c. “II. 2 Engineers shall perform services only in the areas of their competence.” “II. 5 Engineers shall avoid deceptive acts.”
 - i. According to the NSPE, an engineer needs to be qualified to perform a certain task before they choose to undertake it. They should not sign up for any tasks they have no control over. They must choose to lead a project only when they have sufficient experience in the field. An engineer must not falsify their qualifications to secure work, nor can they bribe someone to tip scales in their favor
2. Financial Responsibility
 - a. “1.3 Be honest and trustworthy”
 - i. “Computing professionals should be honest about their qualifications, and about any limitations in their competence to complete a task.”
 - b. Clearly communicate technical and personal limitations that might conflict with the ability to complete a task, not misrepresenting skillset. If a new feature might not be feasible to implement, that is clearly communicated to stakeholders
 - c. “II.4 Engineers shall act for each employer or client as faithful agents or trustees”
 - i. The NSPE describes that engineers shall be upfront about potential conflicts of interest when providing a service, engineers will not accept compensation from more than one party for the exact same work or accept compensation for work not done by them. ACM more so says that the engineer shall be honest about the work that they have completed, its

value to the customer and what it is worth. The engineer shall not overstate their work in an attempt to be compensated more.

3. Communication Honesty
 - a. "1.3 Be honest and trustworthy"
 - i. "The honest computing professional will not make deliberately false or deceptive claims about a system or system design, but will instead provide full disclosure of all pertinent system limitations and problems."
 - b. Communicate truthfully in regards to qualifications, work completed, complications encountered, etc. and do not deceive or intentionally mislead/misguide users, investors, society, employees, or employers.
 - c. "II.3 Engineers shall issue public statements only in an objective and truthful manner."
 - i. The NSPE has multiple sections which address communicational honesty. This section, in particular, addresses how an engineer should present information about successes, challenges, and employment to the public. It notes, "They shall include all relevant and pertinent information in such reports, statements, or testimony, which should bear the date indicating when it was current."
4. Health, Safety, Well-Being
 - a. "1.2 Avoid harm to others"
 - i. "This principle prohibits use of computing technology in ways that result in harm to any of the following: users, the general, public, employees, employers"
 - b. Do everything possible as a company, developer, designer ect. to mitigate the risk of harm resulting from your work. This entails thought, analysis, testing and following set standards when creating solutions to problems. When signs of risk or future harm are noticed in the system it is your obligation to report it no matter the direct consequence that may come to you as an individual.
 - c. "II.1. Engineers shall hold paramount the safety, health, and welfare of the public."
 - i. NSPE gives principles of how engineers should operate in their work to not partake in unlawful practices. These unlawful practices can in turn cause harm to public welfare. ACM focuses directly on the actions and product causing harm to the public
5. Property Ownership
 - a. "1.6 Give proper credit for intellectual property"
 - i. "Computing professionals are obligated to protect the integrity of intellectual property. Specifically, one must not take credit for other's ideas or work, even in cases where the work has not been explicitly protected by copyright, patent, etc."
 - b. This means that we shouldn't take credit for work that isn't ours. Situations where intellectual property is presented (directly or indirectly) as being owned by anyone other than the rightful owner should be actively avoided. Even if the intellectual property isn't protected by law, careful attention should be given to ensure that proper ownership is respected.

- c. "III.9 Engineers shall give credit for engineering work to those to whom credit is due, and will recognize the proprietary interests of others."
 - i. The NSPE entry focuses a bit more on the proper usage of others' resources (only utilizing resources in ways that have been authorized, not duplicating designs without the owner's permission, etc.), while the AMC code focuses on properly crediting the creators of an intellectual property.

6. Sustainability

- a. "1.1 Contribute to society and human well-being"
 - i. "In addition to a safe social environment, human well-being includes a safe natural environment. Therefore, computing professionals who design and develop systems must be alert to, and make others aware of, any potential damage to the local or global environment."
- b. Be aware of the impacts the product you're developing can have on local and global communities in regards to environmental issues. Examples of this can include waste reduction, energy efficiency, and the durability or recyclability of materials.
- c. "III.2 Engineers shall at all times strive to serve the public interest."
 - i. The NSPE code mentions that "Engineers are encouraged to adhere to the principles of sustainable development in order to protect the environment for future generations." It does not explicitly mention the need to alert others of the potential damage like the ACM does.

7. Social Responsibility

- a. "1.1 When designing or implementing systems, computing professionals must attempt to ensure that the products of their efforts will be used in socially responsible ways, will meet social needs, and will avoid harmful effects to health and welfare"
- b. Computing professionals must avoid developing products that will be harmful to people and society at large. They must be aware and up to date on social concerns and potential consequences of their projects.
- c. "III. 2 Engineers shall at all times strive to serve the public interest." "Engineers shall avoid all conduct or practice that deceives the public."
 - i. The NSPE says,engineers should participate in civic affairs to build and develop their community. They should expand awareness on the achievements of engineering, and stick to sustainable development to protect the environment. Engineers should not sign contracts that break these codes, and report any client that forces them to do so to the appropriate authorities. Engineers must keep their statements factual and must avoid manipulating or hiding data to fit a narrative.

5.2 PROJECT SPECIFIC PROFESSIONAL RESPONSIBILITY AREAS

For each of the professional responsibility area in Table 1, discuss whether it applies in your project's professional context. Why yes or why not? How well is your team performing (High, Medium, Low, N/A) in each of the seven areas of professional responsibility, again in the context of your project. Justify.

1. Work Competence
 - a. This applies in our project because we are working on new and unfamiliar technology that requires our members to do independent study about the tools and development practices involved. Technical knowledge is being shared within the team and from outside sources in order to help team members achieve competence in the necessary areas of study.
 - b. The team is performing medium in this because we are still on the early setup stages in regards to the development of the software and more focused on design work. This has meant some technical learning needs to be delayed, but will be focused on closer to the implementation phase of the project.

2. Financial Responsibility
 - a. Financial responsibility plays a role in our project, as it can be tempting to select high-end data sources that are, while easier to work with, very expensive. The continuous costs of the data APIs could easily be passed on to the client and the university, degrading the current and long-term value of our project.
 - b. We believe that our performance for this responsibility is high. To minimize our project costs, we have located a free data source that will fulfill the needs of the client.

3. Communication Honesty
 - a. This is applicable to the project because of the relationship between team members and the client and advisor. The team must be upfront with the client about current progress and make an effort to keep them updated at reasonable intervals.
 - b. The team is performing high in this area because of regular meetings with our client where they have been kept up to date on current progress and have been able to give timely feedback and advice to the team.

4. Health, Safety, Well-Being
 - a. This is applicable to the project primarily because the software will be loaded onto a wearable device. The team will make sure to abide by the safety and health recommendations of the Hololens device in order to ensure that the software encourages proper and safe use of it.
 - b. The team is performing high in this area because we are abiding by Microsoft's official documentation when it comes to interactions on the Hololens and their recommended usage.

5. Property Ownership
 - a. This is applicable to our team as we will be using API sources to receive data. We will also be using a Microsoft Hololens 2, a device we did not create. It is important

to share this information with our users and our client so we give credit where it is due.

- b. The team is performing high in this area as we have communicated this well with our client as well as in our documentation.

6. Sustainability

- a. This criteria does not apply to our project as we will be only using one device and the energy the device requires is minimal.

7. Social Responsibility

- a. This is applicable to our team since the project is a display piece that showcases the ability of Iowa State University engineers. This shows prospective students what they can look forward to building during their time here.
- b. This is not currently applicable to the project since it has not been deployed yet and we can not gauge the success of the project when it comes to attracting students.

5.3 MOST APPLICABLE PROFESSIONAL RESPONSIBILITY AREA

Identify one area of professional responsibility that is both important to your project, and for which your team has demonstrated a moderate or high level of proficiency in the context of your project. Briefly describe what this responsibility means to your project, the ways in which your team has demonstrated the responsibility in the project, and specific impacts to the project that you have observed

Communication Honesty

This responsibility is important to our project because of the relationship between our team and our client and advisor. It has meant keeping our client updated through regular meetings and reports as well as being upfront about any existing tools and software that will be utilized in our final product. We have been able to communicate effectively with the client and ensured that they understand the limitations of the project, difficulties, and planned features. This has allowed the client to respond and give feedback that impacts design decisions in a timely manner.