Methods to Address Ethics in Engineering Applications

A brief introduction on using Virtue Ethics in engineering applications

Tools for your personal and professional life

There are several moral theories that can be used to apply ethics in engineering
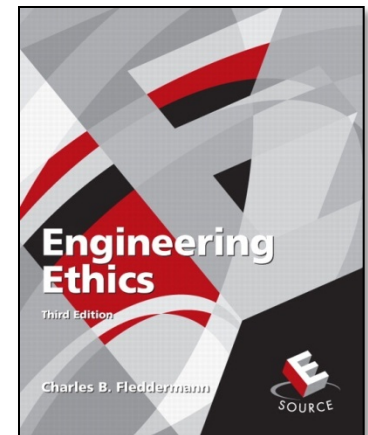
Utilitarianism

Seeks balance between good and bad consequences of an action while accounting for everyone involved (i.e., maximize overall societal well-being, provide benefit to the most people).

Duty Ethics / Rights Ethics

Duties & rights exist regardless of consequences (e.g., the duty not to hurt others, the right to life and freedom).

Virtue Ethics

Individual character traits are the foundation of ethical behavior.

All moral theories have valid applications, but let's use a Virtue Ethics approach.

Overreliance on rules and principles of ethics, such as rule-based codes of ethics or utilitarianism, tends to discount intuition and empathy, and often results in unlivable conditions, hypocrisy, or abandonment of morals

In practice, it has been found that most engineers don't explicitly follow a code or system of ethics in moral situations, instead they rely on their intuition and character

Perhaps if we really want to learn to be ethical, virtue ethics is the best place to start

THE ENGINEERING PROJECT
Its Nature, Ethics, and Promise
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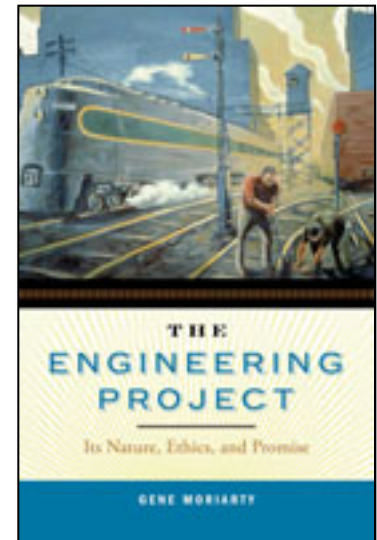
How do we apply Virtue Ethics as Engineers? What does it look like in day-to-day practice?

Despite our worldwide differences in culture, philosophy and religion, there are **common virtues**

Six classes of virtue universally held across time and culture:
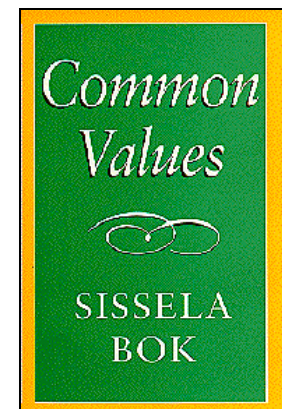
1) **Wisdom & Knowledge**

2) **Courage**

3) **Humanity**

4) **Justice**

5) **Temperance**

6) **Transcendence**

See Bok (2002), *Common Values*, and Peterson & Seligman (2004), *Character Strengths and Virtues*   4

To apply Virtue Ethics in engineering, you can use the following steps …

Step 1: Does your job conflict with your personal morals?

- If yes, what do you do?
- If no, then what?

Step 2: Is an ethical code being violated? Which one?

- Is it macro (system/societal) behavior? - Action likely to occur through a large venue
- Is it micro (individual/small group) behavior? - Individual influence is necessary!

Step 3: Are you the person to address it?

- What kind of help (virtues) will you need?
- What are your virtues?

Step 4: What are the venues by which you can act?

- Anonymous feedback? Social activism?
- Through your own action?
- By building consensus?
- By reporting to the "person in charge?"

Step 5: Evaluate Risk/Benefits of Each course of action

- How much risk does each venue offer? Course of action?
- How likely is it that action will be taken?
- What ethical value does each course of action deliver?

These steps can be further explained through case studies

References

Bok, S. (2002). *Common Values*. Columbia, MO: University of Missouri Press

Barker, J. W. (2008). "Engineering" in AccessScience (Encyclopedia of Science & Technology, 10th ed.), McGraw-Hill Companies. Accessed April 23, 2011: http://accessscience.com/content.aspx?id=233600

Committee on Assessing Integrity in Research Environments, Board on Health Sciences Policy and Division of Earth and Life Studies, Institute of Medicine, National Research Council of the National Academies (2002). *Integrity in Scientific Research: Creating an Environment that Promotes Responsible Conduct*. Washington, D.C.: The National Academies Press. Accessed April 23, 2011: http://www.nap.edu/catalog.php?record_id=10430

Fleddermann, C. B. (2007). Engineering Ethics, 3rd ed. Prentice Hall

Herkert, J. R. (2003). "Professional Societies, Microethics, and Macroethics: Product Liability as an Ethical Issue in Engineering Design". *International Journal of Engineering Education*. 19, 163-167.

Peterson, C., & Seligman, M. (2004). *Character strengths and virtues: A handbook and classification*. Washington, DC: American Psychological Association.

Moriarty, G. (2008). *The engineering project: its nature, ethics, and promise.* University Park, PA, USA: Pennsylvania State University Press.

VIA Institute on Character, VIA Classification of Character Strengths. Accessed April 23, 2011: http://www.viacharacter.org/VIAINSTITUTE/Classification/tabid/81/language/en-US/Default.aspx

Student Conduct Code for the University of Washington, WAC 478-120. Accessed April 23, 2011: http://apps.leg.wa.gov/WAC/default.aspx?cite=478-120