Moral Cognition and Adjustment of Responsible Military Engineers

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Abstract

Technology and warfare have always been inextricably inseparable. In the 18th century, the term "Ingenieur" emerged in Europe to describe professionals engaged in weapon manufacturing and other military-oriented tasks. Over time, as engineering practices diversified, the term "engineer" evolved to encompass broader roles. However, military engineers remain a critical subset of the field. The unique nature of military engineering practices—transforming scientific advancements into tools of warfare—has shaped distinct professional traits for these engineers: high adversariality, stringent secrecy, and unwavering loyalty. Additionally, this role also forces military engineers into ethical conflicts arising from the dual use of technology: to serve humanity or to fuel war. These dilemmas manifest in three core tensions: the object dilemma between country and humanity; the goal dilemma between security and victory, and the path dilemma between confidentiality and democracy. To navigate these challenges, responsible military engineers should adhere to four fundamental principles: self-defense, peace, distinction, and proportionality. Simultaneously, robust frameworks must be strengthened through ethical education, societal oversight, and legal regulation. By doing so, technology in the hands of military engineers could transcend its role not only as a shield for national security but also become a force for shaping a humane, sustainable future.

Keywords: Dilemma; Dual Use of Technology; Ethical Conflicts; Moral Adjustment; War Ethics