Data Science in Military Decision-Making: A Semi-Systematic Literature Review

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Abstract : In contemporary warfare, data science is crucial for the military in achieving information superiority. Yet, to the authors' knowledge, no extensive literature survey on data science in military decision-making has been conducted so far. In this study, 156 peer-reviewed articles were analysed through an integrative, semi-systematic literature review to gain an overview of the topic. The study examined to what extent literature is focussed on the opportunities or risks of data science in military decision-making, differentiated per level of war (i.e. strategic, operational, and tactical level). A relatively large focus on the risks of data science was observed in social science literature, implying that political and military policymakers are disproportionally influenced by a pessimistic view on the application of data science in the military domain. The perceived risks of data science are, however, hardly addressed in formal science literature. This means that the concerns on the military application of data science are not addressed to the audience that can actually develop and enhance data science models and algorithms. Cross-disciplinary research on both the opportunities and risks of military data science can address the observed research gaps. Considering the levels of war, relatively low attention for the operational level compared to the other two levels was observed, suggesting a research gap with reference to military operational data science. Opportunities for military data science mostly arise at the tactical level. On the contrary, studies examining strategic issues mostly emphasise the risks of military data science. Consequently, domain-specific requirements for military strategic data science applications are hardly expressed. Lacking such applications may ultimately lead to a suboptimal strategic decision in today's warfare.

Keywords : data science, decision-making, information superiority, literature review, military