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WHY SOLVE NASA OPEN INNOVATION CHALLENGES? AN ANALYSIS OF SOLVER
MOTIVATIONS FROM NASA'S ASTROBEE CHALLENGE SERIES**Abstract**

In the past decade, NASA and organizations around the world have exploited open challenges as both a source of innovation and a way to increase awareness of their products and business. Some famous examples include the NASA Centennial Challenges, Google Lunar X-Prize, and ESA Grand Challenge. While extensive research has been focused on the novelty and appropriateness of the solutions, and challenge winners have been profiled extensively, little is known about the broader group of participants, and particularly what drives them to participate. Knowing why solvers enter the solving pool can enable organizations, like NASA, to more effectively tap into their motivations and thereby improve challenge efficiency. This paper takes a step towards that goal, analyzing a unique dataset of 8000+ self-reported motivations, produced during the NASA-Freelancer Astrobee Challenge Series. Potential participants were required to fill out a registration survey before they could participate in any challenge in the series, and their participation was tracked during the challenge (i.e., we recorded if they downloaded any challenges, submitted any solutions etc.) Each motivation was classified using a framework from self-determination theory (SDT) and prior research: intrinsic, extrinsic, learning, prosocial, social motivations. We also compared this classification to the four core rewards that motivate participation: good, gold, guts and glory often discussed by practitioners. This enabled a test of whether NASA challenges activate different motivations than do typical challenges. We also coded motivations for specific references to "NASA" and its mission. We found evidence to support "NASA bump", a phenomenon widely discussed in the field but rarely studied, where people are motivated to participate open challenges due to some level of emotional affiliation to NASA. In addition, we tested whether this effect varied with extent of participation (e.g., registered vs. submitted.) We find a positive correlation between people's depth of involvement in the challenge with whether or not they mention "NASA" in their motivation statement. Implications of these findings are discussed.