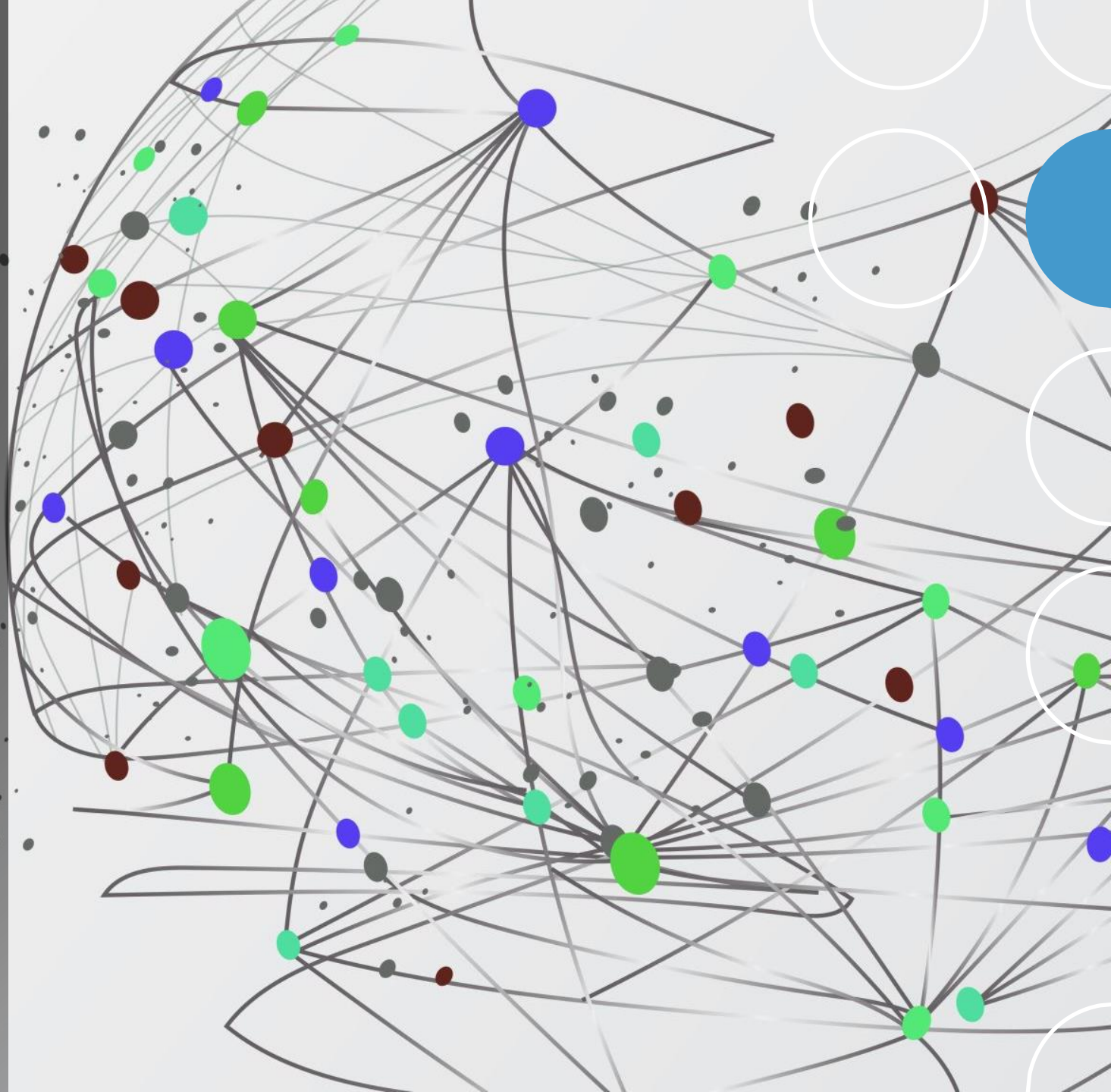


# Research Thrust-4: Human Health and Performance

Exploring relationships between output EVA suit movements to input body movements within the suit

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# Statement of R&D Problem

- Major underlying questions, still unanswered, are what is going on within the extravehicular activity (EVA) suit and how do crewmember' s (input) body movements within the suit translate to (output) EVA suit movements. EVA will be longer and more frequent, especially with planetary missions projected in our future, but EVA carries the highest risk of injury to crewmembers in orbit. Pressurized EVA suits are restrictive and can cause skin irritations, abrasions, overall discomfort, and other injuries. Injuries occur are due to, for example, improper suit fit, shifting, repetitive motions and contact against the suit.
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# Statement of R&D Problem

- The most common areas of injury are on the hands and feet; however, shoulder injuries are among the most serious and debilitating. In efforts to understand what is going on within the suit, there have been several studies on wearable sensors tied to (in suit) body measurements; these have come with various limitations (excess wiring, snag hazards, and inaccurate sensing). Yet, characterizing the interactions between the human-wearer and the EVA suit has remained a critical knowledge gap; a key challenge is knowing the kinematics of the pressured suit and its effects on joint mobility.
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