Cybersecurity Competitions as Esports

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Our goal is to determine if running RIT's Collegiate Penetration Testing Competition (CPTC) in the form of an esports competition in addition to visualizations would increase public awareness and engagement of the event. Currently CPTC essentially runs as teams of "hackers" figuratively hack away at computer stations with minimal audience participation, let alone awareness of what the competitors are actually doing "inside" the opponents' systems. In a similar competition of Capture-the-Flag (CTF) for cybersecurity, one study notes the following:

> *"Unfortunately, for the CTF audience — even one dominated by the technically savvy — viewing these activities is about as engaging as watching small groups of students work on challenging homework problems. These competitions are slow paced, and often take place over an entire day or multiple days."*

To increase participant excitement (and theoretically draw more talent), an August 2019 Wall Street Journal article draws a comparison between esports and cybersecurity competition, especially in terms of attracting and retaining talent. In many esports, two teams try to outwit each other across a network, which is essentially the same kind of competition as CPTC. Marrying a well-established infrastructure for commentators, player biographies, and other key elements may help to enhance spectator engagement in CPTC. Even the notion of "cyberleagues" of teams scoring wins is akin to sports leagues. With the apparent parallels between cybersecurity competitions and esports, we believe that that a competition like CPTC *is* an esport albeit akin to serious games and gameification (dare we use Stackpole's "esportsification" term?), and perhaps most such competitions are, as well.

Visualization for the benefit of the spectator is commonplace in other venues today as illustrated by *telestrators* (see right), e.g. the visual line of scrimmage and first down overlay on the field and the highlighting of the hockey puck. Each of these have increased the ability of novice viewers to understand the intricacies of the competitions.

We propose to hire a team of students to work with RIT's esports production and casting teams to "skin" CPTC so that an audience can comprehend what actions teams perform in real time and how those actions impact the score. The proposed skinning would include the visualizations from the GCCIS proposal, casting, commentary, and other key aspects of an esports event.

We would hire one student full-time to develop a production pipeline for a cybersecurity event by doing the following:

- Build a framework (likely web-based) for player bios, perhaps even as trading cards for gifts.
- Develop training material for casting and "color commentary." Likely we will need to run mock CPTC events during the summer.
- Develop surveys to collect spectator and player feedback following the methodology of the visualization seed proposal.

We are seeking $10360 to cover the following:

- one summer co-op student: $4800 ($12/hr * 10 weeks * 40 hrs/wk)
- Four part-time students for fall 2020: $3360 ($12/hr * 14 weeks * 5 hrs/wk * 4 students)
- Supplies (eg, trading cards): $200
- Travel for presentations: $2000