

1125-VM-2954      **Tugba Karabiyik\*** (tugba@shsu.edu), Lee Drain Building, Room 420, 1900 Avenue I, Huntsville, TX 77340, and **Umit Karabiyik** (umit@shsu.edu), 1803 Avenue I, Academic Building 1, Room 214, Huntsville, TX 77340. *Multi-armed Bandit Problem in Digital Forensics*.

Multi-armed Bandit (MAB) problem is a well-known problem in probability theory and machine learning. It is a problem of decision making when a gambler has multiple slot machines to play. Each machine looks the same but has an independent unknown probability of success and yields a reward. The gambler faces with a conflict in terms of which machine to play, how long to play each machine and in what order to play the machines in order to maximize the total reward. Gittins index is a theorem which gives an optimal solution for maximizing the expected discounted reward for MAB.

Digital forensics (DF) is a branch of forensics science which deals with the investigation and recovery of digital information found in digital devices which are mostly found at crime scenes and belonging to suspects. These devices are searched for evidence using specific techniques and software tools which often perform similar tasks on a given device such as evidence acquisition and validation.

The objective of this research is to create a mathematical model for DF tool selection for particular tasks when multiple tools perform the same task as a MAB problem. We also aim to adapt Gittins Index solution to our problem in order to rank the tools independent of their history of successes and failures. (Received September 20, 2016)