

EE 162

Random Processes for Communication and Signal Processing

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2. *In Dire Need of Some Brains*

In a “life-or-death” scenario, A and B decide to duel but, being poor, they have just one gun (a six-shot revolver) and only one bullet. Being dumb too, this does not deter them and they agree to “duel” as follows: They will insert the lone bullet into the gun’s cylinder; A will then spin the cylinder and shoot at B (who, standing inches away, is impossible to miss). If the gun doesn’t fire then A will give the gun to B , who will spin the cylinder and then shoot at A . This back-and-forth duel will continue until one fool shoots the other. What is the probability that A will win? Also, how many trigger pulls will occur, on average, before somebody wins? The second question has meaning, of course, if there is a large number of pairs of dueling fools; for any particular pair, the duel occurs just once and lasts for a well-defined, specific number of trigger pulls.

(If A and B point the gun at themselves, then this foolish business is simply the two participants alternately playing what is usually called “Russian roulette.” A less violent – but perhaps not by much – form of this game can be found in the ‘sudden death’ playoff between two pro-football teams that are tied at the end of regulation play. There, A is the team that gets first possession of the ball.)

Reference

Kevin McAleer, *Dueling: The Cult of Honor in Fin-de-siècle Germany*, Princeton University Press, 1994.