The Search for Terrestrial Intelligence

In this exercise you will work with your classmates to develop strategies to find a specific form of intelligent life on Earth.

You will develop a strategy to win a game played with another team. Note that you will not *actually* play this game during the exercise; you are just developing optimal strategies to win the game as a thought experiment.

The rules of the game are:

1. This is a *cooperative* game: either both teams win, or both lose.
2. The object of the game is for the teams to find each other (defined as all members of both teams being in the same place—say, close enough to have a conversation—at the same time.)
3. Each team starts the game at a different place, unknown to the other team, and play the game until it is won. For the purposes of this exercise, imagine that your team will start:

   _____

When in doubt about whether a strategy satisfies these rules, you may ask the instructor.

Work with your team to develop a strategy that maximizes your chance of winning. But here's the tricky part:

When strategizing how to win this game, ***you may not assume that the other half of the class in this exercise is the team you are trying to find.*** *You must assume that you would not recognize members of the other team if you saw them, and that you do not know anything about them except that they are playing this game at the same time as you.*

Write down what your strategy would be if you really played the game. Be specific: who will go where, when, and what they will do there. Your strategy should contain enough detail that we can determine the likelihood you would have won the game given another team's strategy.

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Mid-exercise questions

In addition to your search strategy, **also write down** enough that any team member can report your group's consensus answer to these questions:

1. What are examples of *bad* strategies that have essentially no chance of working?

2. What do you have to assume about the other team to build a good strategy?

3. Which assumptions seem obviously valid, which seem reasonable, and which were you not sure you are allowed to make?

4. Do you need to think about what the other team's strategy might be?

5. Do you need to think about what assumptions the other team is making about *your* strategy?

6. What makes a *place* a good one to look for members of the other team? Are some places better to search than others?

7. What makes a *time* a good one to look for members of the other team? Are some search times better than others?

8. How can you be sure you've found a member of the other team?

9. Is it possible to somehow let the other team know your strategy even if you aren't in their proximity?

10. In summary, what is it that makes some strategies superior to others?

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Post-exercise questions

A version of this game was invented by the Nobel laureate Thomas Schelling in his classic book *The Strategy of Conflict* which articulated seminal ideas for nuclear deterrence ("mutually assured destruction") and the causes of racial segregation (he showed that even weak preferences about neighbors by a small minority can create severe segregation).

The specific example he used in his version of the game was "Tomorrow you have to meet a stranger in New York City. Where and when do you meet them?" His point was to illustrate that there are "equilibria" (optimal strategies) in this game, even though at first glance it seems like any strategy is as good as any other.

The key is that the players have certain things in common that they can (must!) assume that the other player will use to find them. Searching under a random overpass at 3:12am is a clearly inferior strategy to "meet at Grand Central Station at noon" (his students' preferred solution when he posed the question to them).

Schelling called these optima in strategy space "focal points", but since that term has another meaning in astronomy we will use their other name, "Schelling points".

1. What are some famous "Schelling points" in SETI?

2. What do they assume about alien intelligence?

3. Go back over the mid-exercise questions with your team and interpret them in terms of common SETI strategies.

4. Now, consider: How would your strategies be different if the other team were not also playing the game?

5. What does this imply about SETI strategies?

6. Are there SETI strategies that do not employ "Schelling points"?

And finally, after reconvening:

7. Look at the strategies the two teams came up with, and now assume that you were, in fact, looking for each other after all. Would you ever win? How long would it take?