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Searching for Winning Strategies in Hex

Hex is the classic 2-player alternate-turn connection game played on a hexagonal n-by-by grid. John Nash famously used strategy-stealing to prove that there exists a winning strategy for the first player, but finding explicit strategies for arbitrary Hex positions is P-space-complete. To date, such strategies are known only up to 10-by-10.

Go expert Jing Yang was first to find such strategies for 7-by-7 through 9-by-9. 10-by-10 was first solved by computer. I will show one way to find strategies both for arbitrary positions. I will also discuss a recent attempt to find new empty-board 10-by-10 and 11-by-11 strategies.

This is joint work with Chao Gao, Wai Yi Low, Justin Francis, Jarrett Knauer and Scott Dupasquier. For more on Hex, see Hex, the Full Story (Hayward and Toft, CRC Press, 2019).