CO 480 Project Proposal – Spring 2015

Project Summary

Person	John Forbes Nash, Jr.
Place	America through World War II, Cold War, and Civil Rights Eras
Problem	Equilibria in Strategic Games
Hook	This is the story of a man who achieved equilibrium between players who were not cooperative in games.

Project Outline

America through World War II, Cold War, and Civil Rights Eras

1. The end of World War II
2. Liberalization of Trade & Rebuilding of Europe
3. Communism vs Capitalism
   (a) Creation of the Eastern Bloc
   (b) Nuclear Arms Race — Mutually Assured Destruction
   (c) Korean War
   (d) McCarthy & the Red Scare
4. Continued Development of Game Theory and its Applications
5. Beginning of Civil Rights Movements

John Forbes Nash, Jr.

1. Early Life
2. Undergraduate Studies — From Chemical Engineering to Mathematics
3. Princeton & Thesis
4. Interests other than Game Theory
5. Family Life
6. Struggles with Mental Illness
7. Nobel Prize & Other Recognitions
8. Recent Exploits - Agency in Game Theory

Equilibria in Strategic Games

1. Introduction to Strategic Games
2. Best Response Functions
3. Pure Equilibria & Cournot Oligopoly
4. Mixed Equilibria
5. Existence of Mixed (Nash) Equilibria
   (a) Sperner's Lemma
   (b) Browser's Fixed Point Theory
   (c) Nash's Existence Proof
6. Practical Applications
7. Lemke-Howson Method for Finding Equilibria

Source Material

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3. Gaddis, John Lewis. *The Cold War: A New History.* New York: Penguin, 2005. Print.
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5. Mccain, K. W., & Mccain, R. A. (2010). Influence & incorporation: John Forbes Nash and the Nash Equilibrium. *Proceedings of the American Society for Information Science and Technology*, 47(1), 1-2.
6. Meltzer, H. (1999). A Beautiful Mind: A Biography. *The Journal of Clinical Psychiatry*, 60(4), 266.
7. Nasar, S. (2001). A Beautiful Mind: *The Life of Mathematical Genius and Nobel Laureate John Nash.* New York: Simon & Schuster.
8. Nash, John F. *Non-cooperative Games.* Thesis. Princeton University, 1950.
9. Nosal, E., & Rupert, P. (2002). A beautiful theory. *Federal Reserve Bank of Cleveland*, 1-4.
10. Saint-Laurent, P. (n.d.). Beautiful minds: The competitive world of financial planning meets the mathematical. *Advisor's Edge*, 5(6), 45.
11. Truman, Harry. "Truman Library - Marshall Plan Online Research File." *Truman Library - Marshall Plan Online Research File.* The Harry S. Truman Library and Museum, 20 May 2015. Web. 20 May 2015. < `http://www.trumanlibrary.org/whistlestop/study_collections/marshall/large/index.php` > .
12. Young, H. P. (2011). Commentary: John Nash and evolutionary game theory. *Games and Economic Behaviour*, 71(1), 12-13.