

Games Programmers [should] Play

- An informal introduction to Game theory , Psychological & Sociological Games

Praseed Pai K.T.

About the Presenter

- ◆ A Seasoned Software Engineering Professional with more than twenty five years of Exposure
- ◆ Author of Two books on Computer Programming
- ◆ Explorer in “Philosophical Tools for Software Engineering” (Has Presented on it, Written one university accredited paper, Designed a Pattern based on Advaita Vedanta to transition from OOP to FRP)
- ◆ An Expert level professional in Cross Cultural Encounters (How to deal with a Russian/Eastern European? , Working with Racial stereotypes like Jews / Chinese / Latin Americans)
- ◆ A Critique of Digital Technology Fads (Programmers will be better off , if they stick to Programming. Do not run after so called AI/ML, BlockChain etc) - “Plumbing is preferred over Painting!”
- ◆ I also help Programmers eliminate their “Math-Phobia”



Seven Deadly Social Dilemmas

◆ Programmers are Social Animals

- ◆ Prisoners Dilemma
- ◆ Tragedy of Commons
- ◆ Free Rider Problem
- ◆ Chicken
- ◆ Volunteer's Dilemma
- ◆ Battle of Sexes
- ◆ Stag Hunt

Aim of this Session

- ◆ To Learn about a universal Lingo which is used by Business people, Technocrats, Consultants and Corporate Strategist.
- ◆ Avoid “Mental Blocks” while competing with people who are smarter than us
- ◆ Understand the Outsourcing and Services Industry “Traps”
- ◆ Introduce How one as software professional can compete and co-operate at an international level
- ◆ How to “tackle” professionals from other cultures? (American/European/Russian/Far East)
- ◆ How to Tackle our uncles/aunts/other relatives who create “nuisances”?
- ◆ How to convince “skeptical colleagues” that one is correct, while articulating fabulous ideas?
- ◆ How to outsmart rookies (upstarts) who challenges you? (relevant for anyone who have had a five year stint in the industry)
- ◆ How to convince more smart people to choose Programming as a career!

An Anecdote involving Games

- ◆ Years ago, a company decided to side line a senior lady, to pressurize her to resign. She was not given any work from a particular day. The stakeholders of the company expected her to call it a day, after a while. She purposefully stayed in the job for nine months, testing nerves of the stakeholders. (She was the wife of a prominent IT personality, no one was interested in irking the guy) => “She did not Chicken Out”

Can we always get Industry standard 30% hike for every hop?

◆ What is your take ?

Can we always get Industry standard 30% hike for every hop?

- ◆ Understand the “Global Delivery Model” pioneered by Nandan Nilekeni
- ◆ Understand the “dreaded” EBITDA?
- ◆ Marging per professional should have 40% EBITDA
- ◆ There is always a Cap on this model
- ◆ Should Move up in the Value chain (how?)
- ◆ Silence of the Environment

Are Seniors in the Industry Snubbed?

- ◆ What are your take?

Four “Snubs” which Seniors face

◆ Anyone who has more than five years of Experience is a Senior!

- ◆ Yet Not in America, might be a struggler?
- ◆ He is all talk, I do code (Talk is cheap, show me the code)
- ◆ Why he has not started yet?
- ◆ If he is that smart, why is he fooling around here?

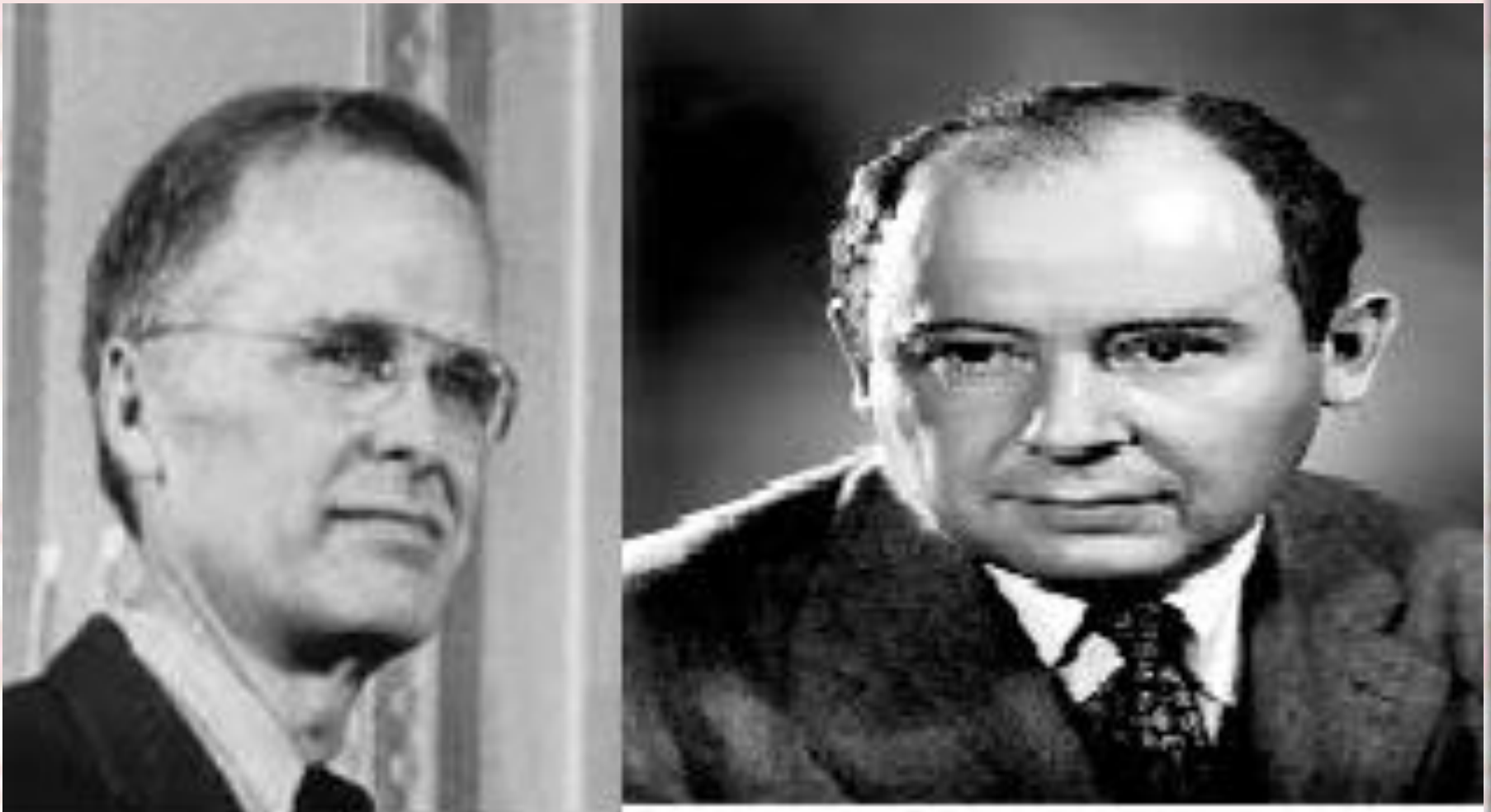
Fair Division

- ◆ How do fair allocation between participants ?
- ◆ In two people game, it is “I cut, you choose”
- ◆ A Software Industry “Take on it”

Game Theory – An Operational Definition

- ◆ Game theory is a bag of analytical (statistical/mathematical) tools designed to help us understand the phenomena that we observe when rational [economic/biological] agents interact, in variety of social situations.
- ◆ We are going to discuss some key results of the discipline and How it occurs in Software Engineers/IT Professional's life, in an “informal” manner

Even Smart People fall into Prediction Traps



Game Theory – The origin

- ◆ Celebrated Text from John Von neumann and Oscar Morgenstein



Do You Think Competitive Trade Via Internet Possible?

- ◆ What is your take ?

What Constitutes a GAME?

- ◆ A game consists of
 - ◆ a set of **players** who exhibits **rational behavior**
 - ◆ a set of **strategies** for each player
 - ◆ the **payoffs** to each player for every possible list of strategy choices by the players
- ◆ Player : a decision maker in a game
- ◆ Rational Behavior: Tendency to optimize the payoff
- ◆ Payoff : The gain or loss to a player at the conclusion of game
- ◆ Strategy: A decision rule that defines a player's move (complete description of a player's move at each stage of the game)

.

Prisoner's Dilemma

- ◆ Mostly, a two person game where despite avenues for co-operation, things often do not manifest itself.

		Player A	
		C	D
Player B	C	1,1	10,0
	D	0,10	5,5

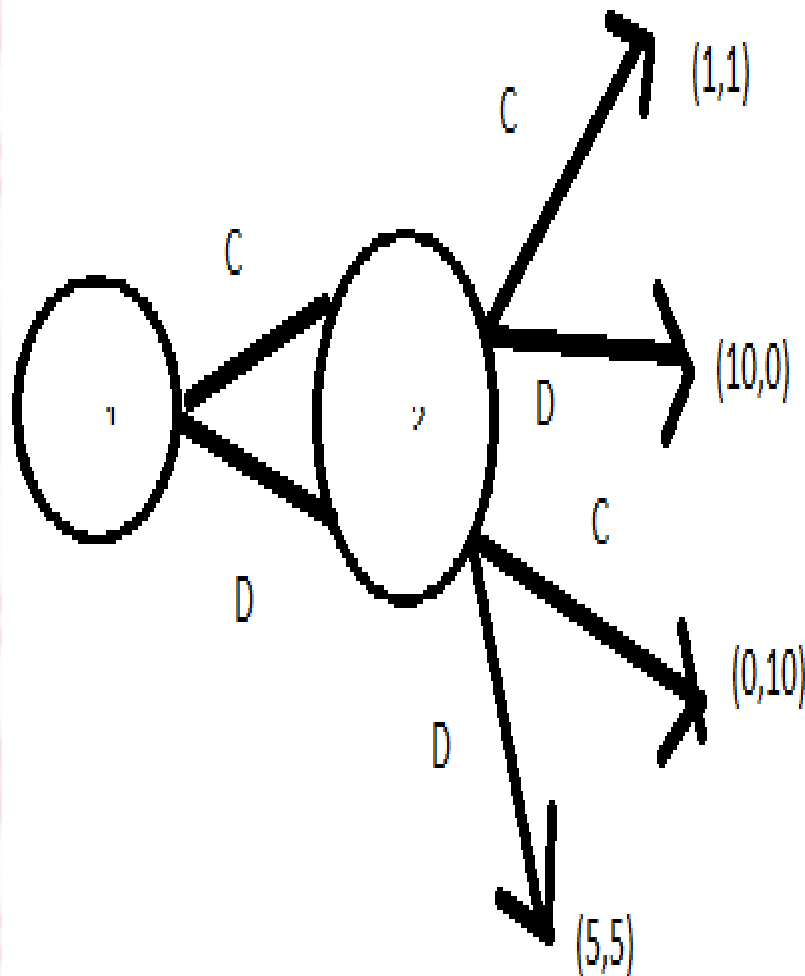
Some instances of Prisoners Dilemma game

- ◆ Mother in Law vs Daughter in Law
- ◆ Israel vs Palestine
- ◆ India vs Pakistan

An IT Outsourcing Scenario

- ◆ When CIOs change, they replace existing vendors and “implant” a new vendor (why?)
 - ◆ A “friendly” vendor
 - ◆ Breaking the Silo
 - ◆ Capex to Opex
 - ◆ Potential for “Goodies”
- ◆ This will ensue a Project Transition game, where Technical people from incumbent and incoming vendor will be “co-operating” to reduce the disruption
- ◆ The Stages are Knowledge Transition, Shadowing, Reverse Shadowing and Sign off
- ◆ A Plethora of Games will ensue in such a “volatile scenario”

Extensive Form vs Normal Form Representation of Games



		Player A	
		C	D
Player B	C	1,1	10,0
	D	0,10	5,5

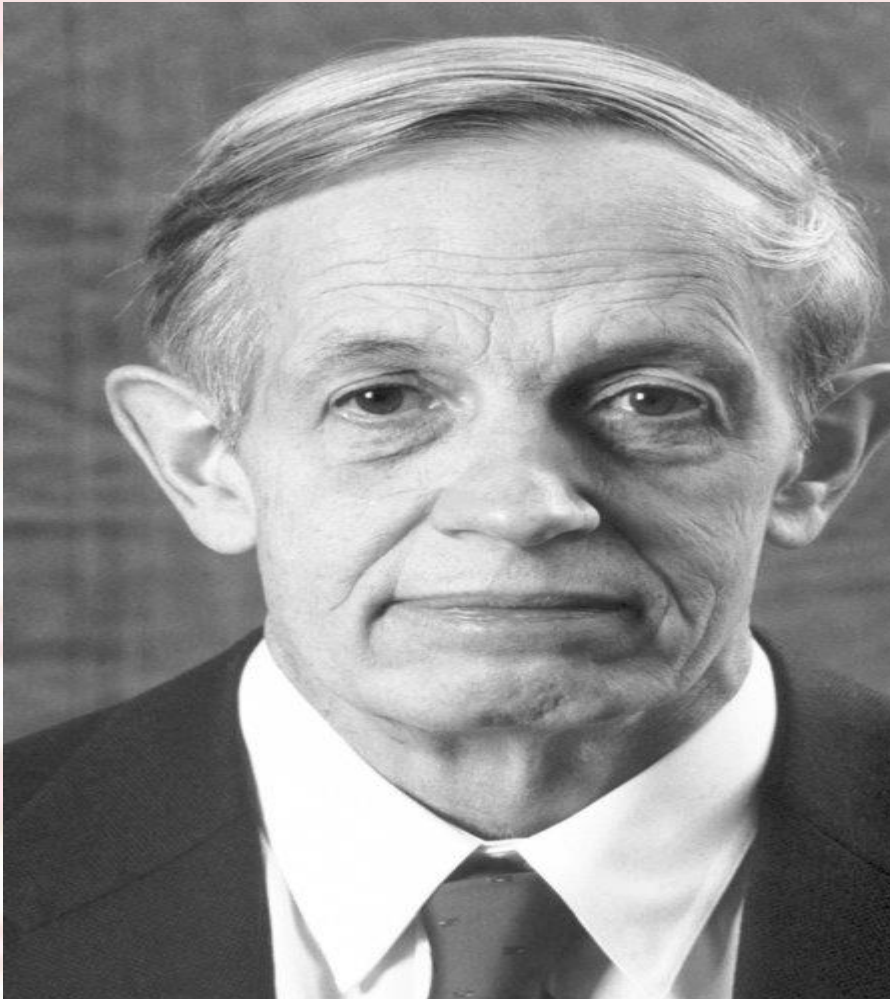
Principle of “Outsourcing” (pun intended)

- ◆ **“When Netherlands and Korea Play soccer, it is expected that Dutch will win every time. Give One extra player to the Korean team. The Korean team will win more times. (As the differential between players at international level is small)”**

Strategy this, that

- ◆ Dominant Strategy
- ◆ Dominated Strategy
- ◆ Pure Strategy
- ◆ Mixed Strategy
- ◆ Nash Equilibrium Strategy
- ◆ Pareto Optimal Strategy

John Nash – A Pioneer in Game theory



Nash Equilibrium

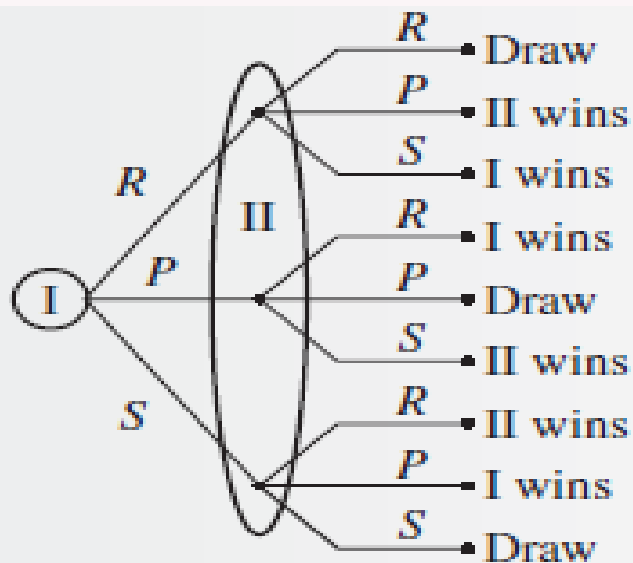
- ◆ When each player adopts a strategy that is **BEST RESPONSE** to the strategies adopted by the rivals. A Strategy Profile is a Nash Equilibrium when no Player can improve his or her odds (his or her payoffs) by switching strategies.
- ◆ There is Pure Strategy Nash Equilibrium and Mixed Strategy Nash Equilibrium

Pure Strategy Nash Equilibrium for PD

		Player A	
		C	D
Player B	C	$-1, -1$	$-4, 0$
	D	$0, -4$	$-3, -3$

Rock, Paper and Scissor Game in Real Life

- ◆ It is one of the most popular game played by kids
- ◆ Three Options are there: Rock, Paper, Scissor



		Player II		
		Rock	Paper	Scissors
Player I	Rock	0, 0	1, -1	1, -1
	Paper	1, -1	0, 0	-1, 1
	Scissors	-1, 1	-1, 1	0, 0

Hawk vs Dove

- ◆ In a Population, comprising of Hawks and Doves, Does Dove has got any chance?

	Dove	Hawk
Dove	4, 4	2, 8
Hawk	8, 2	1, 1

Tragedy of Commons

- ◆ Is logically equivalent to series of PD game played between different pair of agents in a group.
- ◆ Free Rider Problem is a variant which emerges when a group of people availing a shared resources

Some Techniques to resolve PD

- ◆ Repetition and Reputation
- ◆ Bringing an Arbitrator
- ◆ Let's Come together
 - ◆ Communicate, Negotiate, Coalition, Commitment
- ◆ For Repeated games, Robert Axelrod found out that “TIT-FOR-TAT” strategy gave the best overall response
- ◆ In Repeated games, we look to converge to ESS (and it is dynamic)
- ◆ Defect - “TIT-FOR-TAT” - Relaxed “TIT-FOR-TAT” - Cooperate together – Defect cycle

Stag Hunt Game

- ◆ Two Players hunting for a Stag (a bigger animal) and Hare. They can take only equipments for one type. Stag requires two people to co-operate.

		2	
		Stag	Hare
1	Stag	5, 5	0, 4
	Hare	4, 0	4, 4

How to Say No (Politely)? (Three Case Studies)

- ◆ A Case study on ML/Legacy Modernization
- ◆ How to communicate we lack skill in some areas and articulate for the rest?
- ◆ Turning the Tables against Client Stakeholders

Do no go by “Tall” Stories!



Different Kinds of Snobbery and Tactics to Deal with them

- ◆ Accomplishment Snobbery
- ◆ Entrepreneurship Snobbery
- ◆ Intellectual Snobbery

Accomplishment Snoberry

- ◆ Proud Dad Attack
- ◆ Flying Mom Attack
- ◆ Yield and Counter Attack
- ◆ Domain Attack

Entrepreneurship Snobbery

- ◆ BackPaper Entrepreneurship
- ◆ Career Crisis Enterprenuership
- ◆ Social Pressure Entrepreneurship
- ◆ IDEA – Identity driven Entrepreneurial activity

Intellectual Snobbery

- ◆ Direct Attack – Tackling them making things explicit
- ◆ Relevance Attack – A Five ton person things that he is better than a three ton person for a one ton stuff
- ◆ Semantic Attack - “How Intelligent you are? Vs How are you Intelligent?”
- ◆ Crowd Sourced Attack – Override the weightage by “Crowd Sourced” Knowledge

Why do people Snob?

- ◆ First Rank Holder Syndrome – They are trained that way
- ◆ Low ROI – due to information revolution, elite school learning does not pay
- ◆ Proxy Gratification – Accomplishment of wards, relatives, friends as an alibi to override someone
- ◆ Expectations mismatch – Stateful life of a Successful person and his temperament does not match
- ◆ Emotional Ventilation – Frustration with peer group non-acceptance

Some Assumptions which shape Modern Corporates

- ◆ Competence without Comprehension
- ◆ Principle of Least Action
- ◆ Principle of Least Assumption
- ◆ Principle of Least Knowledge
- ◆ Principle of Least Cooperation
- ◆ Redundancy as an assurance device

Biggest Knowledge

- ◆ The Biggest Knowledge one can possess is “Knowledge of One's own ignorance”

Three Idioms



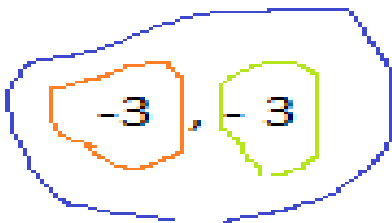


- ◆ Peter Principle
- ◆ Parkinson's law
- ◆ Murphy's Law

Going after Hype has great cognitive value, not much economic value

- ◆ IOT
- ◆ AI/ML
- ◆ Block Chain

Nash Equilibrium for PD

◆ Pure Strategy Equilibrium

		Player A	
		C	D
Player B	C	 -1, -1	-4, 
	D	0, -4	  -3,  -3

Some Patterns of Self Defeat

- ◆ Proof by “Counter Example”
- ◆ Abundance of “Counter Example” (Local Effect)
- ◆ Absence of Evidence is Evidence of Absence
- ◆ “Barking dog Seldom Bite” (a 5% do bite, people categorize you to other 95%, if u speak)
- ◆ Ignoring the “Sidhi” angle (Knowledge which can only be experienced)
- ◆ Decision based on “Halo” effect
- ◆ Empritical procedural knowledge is the only knowledge
- ◆ Base rate neglect (due to ignorance) and ignoring collective intelligence angle

Is Programming an Inductive Activity or a Deductive Activity?



- ◆ What are your take?



No Nash Equilibrium for Matching Pennies

		Player A	
		C	D
Player B	C	1, -1	-1, 1
	D	-1, 1	1, -1

Multiple Nash Equilibria

◆ Battle of Sexes and Matching Pennies

		Player A	
		C	M
Player B	C		0, 0
	M	0, 0	

		Player A	
		L	R
Player B	L		0, 0
	R	0, 0	

Seven Deadly Social Dilemmas Redux

- ◆ Tragedy of Commons
- ◆ Free Rider Problem
- ◆ Chicken
- ◆ Volunteer's Dilemma
- ◆ Battle of Sexes
- ◆ Stag Hunt
- ◆ Last but not the least, Prisoner's dilemmas

Questions

◆ If any ?