

Mid: Game Design and Engineering

Class 1 : 2nd August, 2018

- Games that should not be games
 - Dozen, Blue Whale, Chicken, SockandAwe
- Definition
- Design:
 - Rules
 - Balance
 - Strategy
 - Complexity, Randomness
 - Narrative
 - Player Behaviour
 - Skill Driven Emergent Behaviour
- Engineering:
 - Hardware
 - Software
 - Interfacing
 - Communication
 - Materials
 - Fabrication
 - Usability

Class 2: 9th August, 2018

- Theory of Fun
- Single vs Multi-player games in terms of Social Effect
- *Tafl*
- *The Landlord's Game*
- *Vanikuntapaali*
- *Nine Mens' Morris*
- *Thud*
- *The Mansion of Happiness*
- *Senet : Oldest Board Game*
- *Surakarta*
- *Patolli*
- *Chaupat*
- *Mancala*

- *Chaturanga*
- *Royal Game of Ur*

Class 3: 13th August, 2018

- *Pong, Adventure, OXO*
- Rules
- Play
- Culture
- Game Mechanics [elements]
 - **Space**
 - Mathematical construct where the gameplay happens
 - Discrete or Continuous
 - Dimensions
 - Bounded Areas
 - *Visual Space, physical barriers, soundtrack, lighting, colour*
 - Nested Space
 - **Objects, Attributes, States**
 - Anything that can be manipulated
 - Aesthetics
 - Static and Dynamic
 - Attributes : Categories of info about an object
 - State Diagrams and Machines
 - Properties and Behaviour
 - Relationships
 - Private and public states
 - Secrets and information
 - **Actions**
 - **Rules**
 - **Skill**
 - **Chance**
- Classes of games:
 - **Chance:** Deterministic vs Non-Deterministic (Chance)
 - **Information:** Perfect vs Imperfect Information
 - **Goal:** Zero Sum vs Non
 - **Players:** No. Of players

Class 4 : 23th August, 2018

- **Goals**
 - Concrete

- Achievable
- Rewarding
- **Rules**
 - Parlett's Rule Analysis
 - Constitutional - Foundation
 - Operational
 - Implicit - Behavioural
- **Skills**
 - Mental
 - Physical
 - Social
 - Real vs Virtual
- Balance
- Fairness
- *Bagh Chall*
- Balance Types:
 - Challenge vs Success
 - Competition vs Cooperation
 - Short vs Long

Complexity Slide

- Complexity
- *Fixed, Periodic, Chaotic*
- Meaningful Play
- Emergence
- Game Story
 - Parallel
 - Combinatorial Narratives - Detours - Non-Linear
 - Nodal
 - Modulated
 - Open Structure - With Story Arc
 - Open Structure - Without Story Arc
- Gombauld's Problem
- Estimating Pure Chance is an imaginary skill

AI

- Minimax
- Game Trees
- Alpha Beta Pruning

- Heuristics
- 4 Prominent models of idealised Human Behaviour:
 - Nash Equilibrium
 - Quantal Response Equilibrium
 - Players assumed to make errors, positive strategy has positive payoff
 - Level-K
 - Perfectly rational, infinite intelligence
 - Cognitive Hierarchy
 - Assumption that players base actions on prediction of other players' actions
- Problems with Nash equilibrium:
 - Experimental play violates predictions
 - Complex to Calculate
 - Assumes high rationality
- Pure Strategy Nash equilibrium
- Search vs non-search AI
- Evolutionary Algorithms
- Rational Behaviour
- Irrational Behaviour
- Inference Engine - SOAR