


CS486C – Senior Capstone Design in Computer Science

Project Description

Project Title: Sej Online	
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Project Overview:

Original gaming projects are difficult to come by. As a result, there has been a wave of games re-imagined from their earlier versions, such as Doom ported to console or, more recently, the O.G.R.E. board game brought to life as a computer game. The latter, it is noted, is based on a book and was part of a wave of board games based on Sci-fi stories, such as Avalon Hill's *Starship Troopers* (based on the Robert Heinlein novel). Bringing these games to computers and console is valuable for nostalgia, for introducing older games to a fresh audience, and to give development teams new material on which to sharpen their skills.

In that spirit, I would like to revive a fairly straight-forward non-monetized gambling game from 1980. In that year, author C. J. Cherryh wrote *Serpent's Reach* and created a fictional game called Sej that she used as a plot point in the novel. At the end of the novel, she provided the rules for the game, which fans used and found simple but interesting to play. The rules as provided by the author, with a couple of additional notes, are provided as an appendix to this proposal.

As a project, implementing the rules is probably the most straight-forward part. But other tasks are required, For instance, UI design – not just for the basic game but for facilitating online match play. That would also require keeping track, at a central location, player-versus-player match and cumulative scores. Adding a tournament component would also be desirable. And having the availability of an AI player for offline play would also be good. Clearly, this kind of project would exercise skill in various areas of CS. And, to up the UI challenge, might it be scalable so that it could be presented on multiple platforms (PC, console, mobile)?

The minimum viable product would be:

- Sej rules implemented.
- Network connected two-player mode
- Simple but attractive game and UI.
- Persistent cumulative score-keeping for opponents (tied to user account)

Desired additional features (Stretch Goals):

- Tournament play
- Side-by-side play
- AI for solo play
- Advanced game graphics (animated 3-D dice and wands)
- Multi-platform

Keep in mind that this is to be non-monetized (points only) to keep it both faithful to the game as described by the author and to keep the software family-friendly. Copyright will not be an issue as long as the game is not marketed commercially or posted to the Internet.

Knowledge, skills, and expertise required for this project:

- Familiarity and skill using some form of graphics management and/or game engine; also familiarity and skill with effective and appropriate UI design/development
- Server, database, and/or back-end programming skills for managing central game support
- Familiarity and skill with network communication between players, and central game support
- Other than graphics/game management, familiarity and skill using tools specific to the intended device(s) platform(s), e.g., Android, Unity, iOS, X-Box, etc.

Equipment Requirements:

- Computing device(s) on which game will be developed
- Graphics/Game software development tools, examples mentioned above

Software and other Deliverables:

- The following strong as-built design documents provided in a complete, clear, and professional manner, detailing:
 - Software design, development, and structure
 - Component interfaces for future development
- The following materials, posted to Github or other version control system, as well as saved on mobile memory device (USB drive, storage, etc.) and provided to client:
 - Code and executables for the game (including platform variants)
 - Code and executables for the account-keeping database, post
 - User/Player documentation, both in-game and PDF manual

APPENDIX A

RULES FOR SEJ

Pieces: One pair six-sided dice; trio of four-sided wands: first wand face black, second blue with ship symbol, third white, fourth orange with star symbol.

Object: First player to accumulate 100 points wins.

To start play: high roll of dice determines starting player. The starting player throws the wands and play proceeds.

To score: The players roll dice for possession of the points represented by the wands. The casting of wands proceeds in alternation, one player and the next. The wand-thrower has the option of the first cast of dice; the dice then proceed in alternation during the Hand (this particular casting of the wands). High roll takes the wand or wands in contention, and points are recorded as follows.

Value of wands: stars are 12 points each; ships are 10, white and white with black are 5 points for the white pair combined, but the black is played separately and with its own value; white assumes the value of any wand of color, always the highest in the hand ... and assumes the value of black only if both other wands in the Hand are black; black cancels all points in the possession of whichever player 'wins' the black wand, but cancellation of points is limited to the Game itself. Play always proceeds from ships to stars to black: that is, in a Hand, the dice must first be rolled for possession of ships, then for the stars, and last of all for possession of the black. If a tie occurs in the roll of the dice, the dice are rolled again. If the wands come up doubled or tripled stars or ships or white, the winner of the first of the double or triple set automatically takes the others of that color; for this purpose also, white matches the highest wand of the Hand. Should triple white show, the winner automatically takes Game. Should triple black show, the winner automatically loses Game.

Passing: In this matter rests the skill of the game, judging when to pass and when to risk play. A Hand containing a single black wand or any number of black wands may be declined by the thrower of wands, thus entirely voiding the Hand: the dice will not be rolled; the wands pass into the hand of the next player, who will cast again, with all privileges of the wand-thrower. Further, a player with the option to throw either wands or dice may voluntarily pass that option to the next player, who is not, however, obliged to accept: the player who has passed will receive the wands or dice again in alternation. The latter is a matter of courtesy and custom of the game: highest or decisive points are played last.

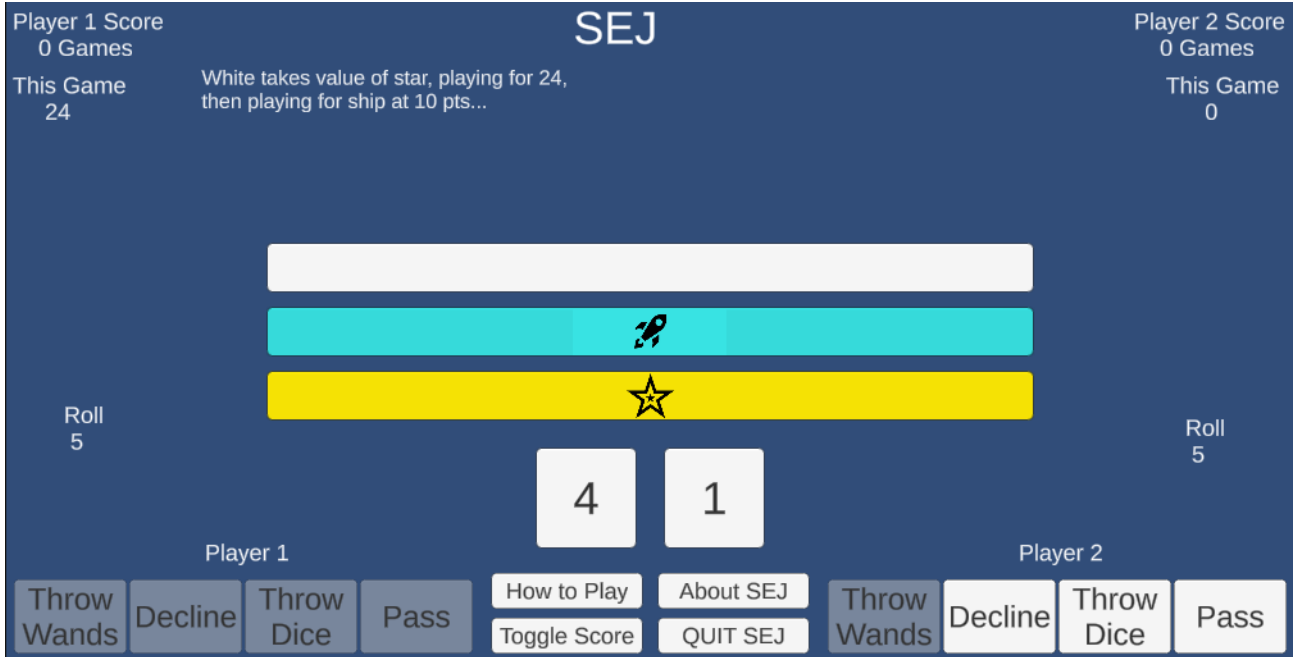
- From last pages of *Serpent's Reach*, copyright C. J. Cherryh, 1980

Notes to rules: Passing is limited; when a player has passed and the opponent passes back, then the play is declined (to avoid interminable back-and-forth passing). Also, once a player has thrown the dice, the other player must roll for possession of the points (or black).

A couple of examples: White – Ship – Star: White pairs with the star so there are two sets of rolls, for the 10 points (ship) and for the 24 points (star and white).

Star – Ship – Black: there are three rolls, first for the ship, then for the Star. At the black, it is common for the person with the most points to attempt to pass, while the person with few points (and little to lose), will attempt to play in the hope that the opponent will 'win' the black, losing all their points.

To score a series of games, final points may be accumulated or a running tally of wins may be kept.



Above is from a primitive, unpublished PC-based game that shows the wands and dice in 2-D, has no networking, and no tally of player scores beyond the current session. Also note that it incorrectly plays stars before ships. But it gives an idea of the game.