



Texas Holdem Monte Carlo Simulator

INETA Component Code Challenge

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[Http://www.TheG2.net/TexasHoldem](http://www.TheG2.net/TexasHoldem)



Introduction: Background

- Overview of Texas Holdem
 - Poker game where each player gets two “Pocket Cards” face down
 - 5 public “Board Cards” are dealt face up for all players to play off of
 - 5 betting rounds: Preflop, Flop, Turn, and River.
- Odds of winning on each round are well defined but very hard to calculate. There are over 1300 unique 2 card preflop hands, and hundreds of thousands of possible 5 card combinations for the board.
- Monte Carlo algorithms can be used to estimate a hand’s Win/Lose/Tie odds before the final card is dealt.
- Identifying opponent hands that currently or could potentially beat your hand is key to mastering the game



Introduction: Project Goals

- Utilize an existing open source poker library to create a Texas Holdem hand analysis program that supports Monte Carlo Simulations.
- Create class libraries that can be reused in other projects (Winform, WPF, Silverlight, Windows Mobile, ASP.NET)
- Provide analysis for both full 7 card hands (Pocket + Board) or partial hands (Pocket Preflop, Pocket + Flop, or Pocket + Flop + Turn)
- Use color coding and a grid layout to let users quickly identify which opponent hands could beat them.
- Display player Win / Tie / Lose statistics to show the strength of your hand



Software Components: Poker Library

- Lots of open source libraries to choose from. Here are 13 examples:
<http://www.codingthewheel.com/archives/poker-hand-evaluator-roundup>
 - Most of my experience has been in C# and ASP.NET, so a .NET library was a must!
 - Decided to use HandEvaluator: Keith Rule's C# port of the C based Pokersource Evaluator
 - Pure C# code: no P/Invokes or external libraries needed
 - FAST!: makes extensive use of lookup tables for optimal performance
 - Open Source: Code is released under GPL and includes good examples
- Link: <http://www.codeproject.com/KB/game/MoreTexasHoldemAnalysis1.aspx>
- Link: <http://pokerforprogrammers.blogspot.com/>



Software Components: Prototype

- Wanted to be able to quickly prototype the application to learn what works best
- Resolver Systems: Resolver One
 - Spreadsheet built using IronPython
 - Full compatibility with other .NET components
 - Interactive IronPython Console makes it easy to debug and troubleshoot
 - Fun way to play around and learn IronPython!

Link: <http://www.ResolverSystems.com/>



Software Components: Windows Mobile

- Wanted to have a Windows Mobile version to run on a PDA or Cell phone at home poker games
- Converted HandEvaluator to Compact Framework
- ComponentONE Studio for Mobile: C1FlexGrid
 - Easy to install
 - Uses Styles to format cells (similar to CSS Classes)
 - OwnerDrawCell mode lets you customize cell formatting

Link: <http://www.componentone.com/SuperProducts/>



Software Components: Windows Forms

- Wanted to have a Windows Forms applications that could be used while playing online poker.
- Requirement: Reuse code for future applications written in WPF, Silverlight, or ASP.NET
- Telerik RadControls for WinForms – RadGridView
 - Many different display and formatting options
 - Support for generating ToolTips (display hand statistics)
 - Other RadControls for WPF, Silverlight, and ASP.NET

Link: <http://www.telerik.com/products/winforms.aspx>



Software Demo

- Initial Prototype in Resolver One
- Windows Mobile Version
- Windows Forms Version

Download code and executables at:

[Http://www.TheG2.net/TexasHoldem](http://www.TheG2.net/TexasHoldem)



Future Work:

- Use RadGridView nested views to display more details for each hand...
- WPF Version
 - Using Windows 7 Touch API?
- Silverlight Version
 - Need to recompile HandEvaluator library for Silverlight
- ASP.NET Version
 - Use Microsoft Azure to provide more comprehensive Monte Carlo simulations?



More Information:

- Project website: <http://www.TheG2.net/TexasHoldem>
 - Source code, executables, and documentation
- Personal Blog: <http://Blog.TheG2.net/>
- Code Blog: <http://CodeBlog.TheG2.net/>

Enjoy!