Massachusetts Institute of Technology
6.9630 Pokerbots Competition

IAP 2025
Lectures MTWR 12:00-1:30 in 6-120
Recitation/Office Hours 2-4 in 26-168
Zoom Link: pkr.bot/zoom

Staff

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Links

Homepage:	pokerbots.org
Zoom Link (always use shortened version):	pkr.bot/zoom
Piazza:	pkr.bot/piazza
Resources:	pkr.bot/resources
Scrimmage Server:	pkr.bot/scrimmage
Lecture Recordings	pkr.bot/panopto
Canvas page:	pkr.bot/canvas
Find Teammates:	pkr.bot/teammates
Instagram:	pkr.bot/instagram
Github:	pkr.bot/github

Introduction

Pokerbots is an annual month-long programming competition in which students form teams of 1-4 members to create an autonomous poker-playing algorithm (a "pokerbot"). Over the four weeks of IAP, the open-ended project in pokerbot design builds skills in computer science, game theory, mathematics, and machine learning.

Students will learn how to think about developing their pokerbots by attending twelve lectures and will have the chance to test their skills in competition against their peers. In class, students will learn about topics ranging from poker strategy to reinforcement learning, and their applications to building a successful pokerbot. A scrimmage server will be run throughout the month allowing teams to challenge each other at any time. There will be a mini tournament at the end of each of the first three weeks. In the fourth week, teams may continue to work on their pokerbots separately. During the final tournament, teams' finished pokerbots are put to the test in a tournament for exciting prizes.

Poker is a complex yet highly accessible challenge: it's easy to learn, but difficult to be competitive in. Building a pokerbot is similar, as anyone can make an elementary bot, but building a competitive bot requires a deep understanding of the strategies adopted by other teams and how to contest them. At the heart of the Pokerbots competition is the challenge of applying the algorithmic and strategic thinking taught in theoretical courses.

Evaluation

6.9630 is graded on a pass/fail basis. To receive a passing grade, students are expected to fulfill both of two requirements: participation on the scrimmage server, and completion of a final strategy report. All teams who meet the below requirements in good faith will receive a passing grade.

Participation

Pokerbots is designed to encourage exploration. Students who put more effort into trying new ideas to design a winning pokerbot will have greater learning opportunities and a better chance to win prizes. To earn credit, students are expected to put sustained effort into developing their pokerbots. This will be judged by submissions each week during which each team's pokerbot will be evaluated for improved performance relative to their previous week's submission and against a bot that implements a random strategy.

Make-up

If a team fails to submit their pokerbot or improve their pokerbot from one week to the next, that team is expected to submit a half-page double-spaced make-up report describing the attempted improvements for the week and thoughts on why they were unsuccessful. This is intended to avoid penalizing students who explore avenues that do not end up resulting in successful strategies. Make-up reports (if necessary) are due the Tuesday following each mini tournament. Reports should list all team members and be emailed to pokerbots@mit.edu

Final Report

Each team is expected to submit a 3-5 page double-spaced strategy report outlining the techniques they used in developing their final pokerbot, due in the last week of IAP. These reports are meant to catalog the effectiveness of strategies explored throughout the class, as well as describe the distribution of work. Diagrams are optional, but *highly* recommended. In particular, the report should highlight the strategic and/or architectural insights that went into your team's pokerbot, and primary takeaways from the month.

Structure

Over the course of IAP, students have five main touchpoints with the course: class sessions, Piazza, the scrimmage server, Github, and the final event.

Class

There will be twelve lectures in person every Monday through Thursday (6-120, 12-1:30PM), each which will be applicable to developing a successful pokerbot. These lectures will be recorded. Recitation and Office Hours will be held after each lecture (26-168, 2-4PM), as well as on most non-lecture days (info will be posted on Piazza). Each lecture will have provided lunch and one or more giveaways with nice prizes! All of these sessions are available virtually at pkr.bot/zoom, which will be updated to always direct to the correct zoom link.

Piazza

Piazza is an online forum we will be using to answer questions and make announcements. It's important to check Piazza regularly for updates and changes we may make. You can post (publicly or anonymously to everyone or the instructors) and a member of the Pokerbots team will respond as soon as possible (last year, the average response time was less than 1 minute!). You are also encouraged to answer other students' questions, and we will be rewarding students who contribute the most in this manner over the month. Note that an MIT email address is required to join - if you have issues, please contact the staff.

Scrimmage Server

The scrimmage server is how you will gauge the performance of your pokerbot relative to reference bots and other teams. On the scrimmage server, you can challenge your opponents and keep track of useful bot statistics. This year, we introduce a new Playground feature where you can manually interact with your own or another's pokerbot to get a feel for how it operates in practice. Furthermore, all mini-tournament submissions are done by uploading your latest bot to the scrimmage server. We'll be giving out prizes based on your performance on the server as well!

Github

Throughout this course we will be posting materials, and additional resources to Github. This is where the Engine repository can be found, as well as any sample code from lecture. We will be uploading slides and a recording after every lecture as well.

Final Event

Pokerbots culminates in a virtual final event on January 31st, 2025. This is where we will announce the winners of the final pokerbots tournament, as well as give out all of our biggest prizes. There will be fun and games, as well as a chance to meet and network with our sponsors directly! More details about the final tournament and event will be posted on the course Piazza as the date approaches.

Other Events

We will be hosting a variety of other events such as afternoon study breaks, poker socials, hackathons, and sponsor networking events. These events are more informal and spontaneous, and information or details would be on Piazza as they approach.

Timeline

Week 1	
Mon 1/6	Lecture 1: Intro to Pokerbots Recitation: Environment Setup
Tue 1/7	No Class: Cancelled
Wed 1/8	Lecture 2: Probability and Statistics Recitation: Poker Social!
Thu 1/9	Lecture 3: Poker Strategy
Fri 1/10	Week 1 Bot due 11:59pm
Sat 1/11	**Mini Tournament #1**
Week 2	
Mon 1/13	Lecture 4: Game Theory Recitation: NumPy and other Stats Packages
Tue 1/14	Lecture 5: Machine Learning
Wed 1/15	Lecture 6: Reinforcement Learning Hackathon!
Thu 1/16	No Class: Hackathon
Fri 1/17	Week 2 Bot due 11:59pm
Sat 1/18	**Mini Tournament #2**
Week 3	
Mon 1/20	No Class: MLK Day
Tue 1/21	Lecture 7: Counterfactual Regret Minimization
Wed 1/22	Lecture 8
Thu 1/23	Lecture 9
Fri 1/24	Week 3 Bot due 11:59pm
Sat 1/25	**Mini Tournament #3**
Week 4	
Mon 1/27	Lecture 10: Guest: *GTO Wizard*
Tue 1/28	No Class: Final Report/Bot Strategy Report due 11:59pm
Wed 1/29	Lecture 11: Guest: Noam Brown, *OpenAI* Poker Social! Final Bot due 11:59pm
Fri 1/31	**Pokerbots Final Event**

Prizes

The prize pool for Pokerbots 2025 is over **$50,000.** Here's the breakdown:

Final Tournament Prizes	
First place	$10,000
Second place	$6,500
Third place	$3,500
Fourth place	$2,000
Fifth place	$1,000
First place in language (Python, Java, or C++)	$500 x 3
Second place in language (Python, Java, or C++)	$250 x 3
Third place in language (Python, Java, or C++)	$125 x 3
Best freshman-majority (>51%) team	$2,000

Scrimmage Server Prizes	
Weekly tournament winner	$1,000 x 3
Weekly tournament biggest upset	$500 x 3
Weekly tournament most improved	$750 x 2
Most time at the top of the scrimmage server	$1,000

Miscellaneous Prizes	
Most helpful Piazza students	$250 x 3
Surprise prizes, lightning tournaments, raffles	$15,000

We'll be holding raffles during each of the classes and events for great tech prizes!

Sponsors

Platinum

At Hudson River Trading (HRT) we are mathematicians, computer scientists, statisticians, physicists and engineers. We research and develop automated trading algorithms using advanced mathematical techniques. We have built one of the world's most sophisticated compute environments, and our researchers are at the forefront of innovation in the world of algorithmic trading and machine learning.

HRT was founded in 2002 by computer scientists and mathematicians who believed that math and technology could transform financial markets. They developed the algorithms that became the foundation for HRT's continued success across global asset classes.

Today, we are global industry leaders, and a leading voice for fair and open markets. Our trading creates stronger markets for all investors, and all our work is built upon our rigorous code of ethics.

As a leading financial services firm, we leverage cutting-edge technology to provide execution services and data, analytics and connectivity products to our clients and deliver liquidity to the global markets. Leveraging our global market making expertise and infrastructure, Virtu provides a robust product suite including offerings in execution, liquidity sourcing, analytics and broker-neutral, multi-dealer platforms in workflow technology.

Jump Trading is a global algorithmic trading firm that combines sophisticated quantitative research, cutting-edge technology, and an entrepreneurial culture. Founded in 1999, Jump has 1,500+ employees across offices in Chicago, New York, London, Amsterdam, Paris, Singapore, Shanghai, Mumbai, Sydney, and Hong Kong.

Jump's culture of continuous learning and innovation has attracted some of the most brilliant minds from around tech, trading, and research. We've built one of the largest supercomputers in the world to allow our team to test their most sophisticated ideas, and we continuously develop custom software and hardware to maximize the impact of our strategies.

Gold

IMC is a leading trading firm, known worldwide for our advanced, low-latency technology and world-class execution capabilities. Over the past 30 years, we've been a stabilizing force in the financial markets – providing the essential liquidity our counterparties depend on. Across offices in the US, Europe, and Asia Pacific, our talented employees are united by our entrepreneurial spirit, exceptional culture, and commitment to giving back. It's a strong foundation that allows us to grow and add new capabilities, year after year. From entering dynamic new markets, to developing a state-of-the-art research environment and diversifying our trading strategies, we dare to imagine what could be and work together to make it happen.

Jane Street is a quantitative trading firm with offices worldwide. We hire smart, humble people who love to solve problems, build systems, and test theories. You'll learn something new every day in our office—whether it's connecting with a colleague to share perspectives, or participating in a talk, class, or game night. Our success is driven by our people and we never stop improving.

CITADEL | CITADEL Securities

Citadel is one of the world's leading alternative investment managers. We manage capital on behalf of many of the world's preeminent private, public and nonprofit institutions. We seek the highest and best use of investor capital to deliver market leading results and contribute to broader economic growth.

Citadel Securities is a leading global market maker. We provide institutional and retail investors with vital liquidity to trade an array of products in any market condition.

FIVE RINGS

Five Rings is a proprietary trading firm with offices in New York and London founded with a vision of combining strategy, innovation and technology to succeed in today's global markets. We work in teams – Developers, Quants, Traders - continuously designing and optimizing.

Gold (continued)

Midpoint Markets is a proprietary trading firm leveraging systematic, quantitative strategies to solve complex challenges in cryptocurrency trading. Founded in 2018 by a team of computer science and mathematics experts, we have since grown to a dynamic firm with over 100 years of collective experience, bringing senior talent from top quantitative trading and market-making firms in traditional finance.

We collaborate with the world's largest cryptocurrency exchanges to provide liquidity and optimize market efficiency across diverse digital assets, delivering innovative and scalable solutions in a fast-evolving, highly competitive environment.

Trexquant is a leading quantitative finance firm specializing in the development of multi-asset portfolios through advanced machine learning methods. The firm continuously enhances its investment and research platform, utilizing a vast array of data variables to create complex trading models and strategies. These models generate trading signals aimed at outperforming market conditions globally.

DRW is a diversified trading firm with over 3 decades of experience bringing sophisticated technology and exceptional people together to operate in markets around the world. We value autonomy and the ability to quickly pivot to capture opportunities, so we operate using our own capital and trading at our own risk.

Headquartered in Chicago with offices throughout the U.S., Canada, Europe, and Asia, we trade a variety of asset classes including Fixed Income, ETFs, Equities, FX, Commodities and Energy across all major global markets. We have also leveraged our expertise and technology to expand into three non-traditional strategies: real estate, venture capital and cryptoassets.

We operate with respect, curiosity and open minds. The people who thrive here share our belief that it's not just what we do that matters–it's how we do it. DRW is a place of high expectations, integrity, innovation and a willingness to challenge consensus.

Gold (continued)

Codeium (Series C, $1.25B) is a leader in the AI coding space, giving hundreds of thousands of developers autocomplete, in-IDE chat, and Windsurf, the best AI-native editor on the market. Founded by MIT alums and located in Mountain View, we're hiring for positions across the board!

Silver

CTC®
CHICAGO TRADING COMPANY®

Chicago Trading Company (CTC) helps the world price and manage risk. We pride ourselves on our strong values, our entrepreneurial spirit, and our commitment to doing the right thing. Our culture is highly collaborative across traders, quants, technologists and development teams who work together to solve the toughest problems our markets have to offer. We strive to make a positive impact on our industry, the lives of our employees, and the communities to which we belong.

2σ TWO SIGMA

Two Sigma is a financial sciences company. We combine rigorous inquiry, data analysis, and invention to solve hard problems across financial services.

We're looking for people who see beauty in data and the possibilities it reveals. Researchers who see connections and patterns in unexpected places. Engineers who build tools that channel massive amounts of data into insights. And experts across business disciplines to help solve the toughest challenges in investment management, insurance, market-making, private equity, and venture capital.

SUSQUEHANNA

Susquehanna is a global quantitative trading firm founded by a group of friends who share a passion for game theory and probabilistic thinking. Our rigorous and analytical approach to decision making has led Susquehanna to become one of the largest and most successful proprietary trading firms in the world. Our employees are relentless problem solvers who collaborate to make optimal decisions.

Susquehanna's deep integration of trading, technology, and quant research makes us experts in trading essentially all listed financial products and asset classes, with a focus on derivatives. We handle millions of trading transactions around the world every day as both a market maker and market taker. Our efforts provide liquidity and ensure competitive prices for buyers and sellers. While our presence in the market is broad, our trading desks are highly specialized to allow for a deep understanding of the unique drivers of each asset class.
