

Course Overview

Class Community Overview

Lecture 0 (2023-03-08)

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By chatGPT

Course Overview

Course Logistics

- Title: Building Web3 & Blockchain Applications
(CS492 Special Topics in Computer Science)
- Date: Every Wednesdays (8 March - 7 June)
 - 19 April no class and no exam
- Time: 16:00 – 18:50 KST(GMT+9)
 - 16:00 – 17:20 session 1
 - 17:20 – 17:30 break
 - 17:30 – 18:50 session 2
- Place: Online zoom (Live)
 - The last lecture(7 June) will be face-to-face in KAIST
(+ online zoom for participants who can't join offline)
- Language: Lectures in English
- No textbook
- Credit: 3 (Pass / Fail)
- Grading: A final project (No homework, no exam, no quiz)
- Professors: Jaesun Han, Min Suk Kang, Sukyoung Ryu

Instructors



Jason Jaesun Han

Adjunct Professor
KAIST School of Computing



Min Suk Kang

Assistant Professor
KAIST School of Computing



Sukyoung Ryu

Professor
KAIST School of Computing
Head of the School of Computing



Min Suk Kang (<https://netsp.kaist.ac.kr>)

- Assistant Prof., School of Computing, KAIST (Since Aug 2020)
- Assistant Prof., School of Computing, NUS (2016-2020)
- Ph.D. ECE, Carnegie Mellon Univ (2016)
- MS & BS, EE, KAIST, South Korea (2008 & 2006)

[ACSAC'18]

[WiSec'13]

List of blockchain research projects:

- Partitioning Bitcoin peer-to-peer networks
- Guaranteeing partition-resistant blockchain p2p
- Low-cost eclipse attacks in Ethereum
- Mixing Bitcoin transactions for better privacy
- Discovering consensus bugs in Bitcoin and Ethereum
- Enforcing network service guarantees for public blockchains
- ...

Privacy



Sukyoung Ryu

(<https://plrg.kaist.ac.kr>)

- Head, School of Computing, KAIST (Since March 2021)
- Assistant/Associate/Full Professor, School of Computing, KAIST (Since December 2009)
- Ph.D., CS, KAIST (2001)

Preventing/Finding/Fixing Bugs & Vulnerabilities

<https://plrg.kaist.ac.kr/research/publications>

Automatic Translation of C to Rust
[ICSE 2023]

Programming Language Tools
[FSE 2022 & PLDI 2023]

Finding Bugs in JavaScript Apps
[IEEE SW 2019 & FSE 2021]

Automatic Software Generation
[ASE 2020/2021 & ICSE 2021]

Vulnerabilities in Various Langs
[ASE 2020 & ICSE 2020/2021]

Preventing Bugs by Type System
[POPL 2019 & ICSE 2019]

Please call me **Jason**



Web3@KAIST

Building Web3 Apps to Solve Real Problems

2023 – Present
KAIST School of Computing
Adjunct Professor

Web3



2018 – 2022
Founder & CEO

Blockchain



2014 – 2018
Cofounder & CTO

**VC &
Accelerator**



2011 – 2014
CEO

**Big Data
Cloud
Computing**



2007 – 2011
Founder & CEO
(Acquired by KT)



2007 – 2015
KAIST IM MBA Adjunct Professor



2000 – 2005
KAIST EECS Ph.D

**Distributed
Computing**

Teaching Assistant



Mingyu Jo (Aaron)

- Undergraduate of KAIST School of Computing
- Co-Founder of ATIV
- Vice-President of Decipher

Contact

- jomingue2107@gmail.com
- telegram: @jmg2107

Course Objectives

- Understanding the principles and concepts of web3
- Understanding the full stack of web3 technology
- Exploring real-world use cases
- Applying web3 to real-world problems
- Building and deploying web3 applications



- Use this class as a starting point for your Web3 journey
- Add blockchain and Web3 to your skillset (It's rare!)

Course Culture and Policy

- **Learn by doing**
 - The best way to learn Web3 is to dive into it
- **Do it yourself**
 - You get what you put into it. No one will push you.
 - No homework, no exam, no quiz
 - Only a final project implementing a Web3 app
- **Be respectful**
 - Everyone has different ideas and goals
- **Try to accept first, criticize later**
 - If you criticize from the start, you will learn nothing.

Course Curriculum

- **The first half(by mid-term): the basic and development of web3**
 - web3 concept and use cases
 - blockchain technology basic and advanced topics
 - smart contract programming with solidity
 - web3 app development
 - web3 tokenomics and governance
- **The second half: the web3 stacks and applications**
 - Fungible asset application (crypto, stablecoins, DeFi)
 - Non-fungible asset application (NFT, SBT, etc)
 - web3 in creator economy, IP business and metaverse
 - web3 games and DAO(decentralized autonomous organization)
 - Guest lectures on real-world web3 apps

Final Projects – Overview

- **Grading: Pass / Fail (S/U Grades only; no letter grades)**
 - Students chooses from 1) a Web3 app prototype or
2) a Web3 startup proposal.
 - “Pass” will be given only when a student
 - 1) demonstrates a complete Web3 app prototype (Option 1) or
 - 2) presents a promising Web3 startup proposal (Option 2)
 - Attendance alone does not guarantee “Pass”
- **Recommend a team of up to 3 people for a project**
 - Allow you to create a team with any students or external auditors
 - Allow for one-person team with no benefits
 - Highly recommended to be mentored by industry experts
 - Matching with mentors will be given in the class community

Final Projects – Two Options

- **Option 1. Web3 app prototype**

- Building a Web3 app prototype with smart contracts and web frontend
- Highly recommended to use EVM-compatible blockchains like Ethereum, Klaytn, Polygon, L2, etc
- Deliverable: 1) Web3 app introduction deck (a presentation file under 10 slides)
2) Running Web3 app and public git repository
3) Video presenting the Web3 app prototype running (5 minutes)

- **Option 2. Web3 startup proposal**

- Planning a Web3 app and building an architecture of the Web3 app
- Proposing an incentive model and a governance scheme for a target community
- Deliverable: 1) Web3 app whitepaper (a word file under 10 pages)
2) Web3 startup pitch deck (a presentation file under 10 slides)
3) Video presenting the pitch deck (5 minutes)

Final Projects – Schedule

- 8 March – 14 March: Join discord (slide 15)
- 8 March – 31 March: Form a project team (slide 10)
- 8 March – 31 March: Post ideas to the project idea board (slide 20)
- 27 March – 31 March: Match mentors and project teams (slide 21)
- 1 April – 14 April: Submit the 1 page proposal of a final project
(Idea change will be allowed in the final deliverable)
- 14 April – 30 May: Submit a final project
- 31 May – 6 June: Evaluate final projects
- 7 June(The last lecture): Award outstanding projects

Policy for auditors

- **Auditors have no obligation to the class**
- **Auditors are allowed to do everything students do**
 - Listen the lectures
 - Join the class community
 - Work on a final project (mentoring will be provided)
- **Advice for auditors**
 - Be proactive. We will treat you the same as students
 - Take the time to learn Web3 properly
 - Make Web3 your own by doing a final project
 - Make good use of the community

Class Community Overview

Web3@KAIST: Class Community

- **Why Community?**
 - Learn by doing (A community is the core of web3)
 - Connecting students and mentors(industry experts)
 - Serving as target users of your web3 app
- **Community members: total 371 people**
 - KAIST students: 176
 - External auditors: 124 (from other universities and industries)
 - Mentors (industry experts): 58
 - Community staff: 9
 - Teaching assistant: 1
 - Professors: 3

Web3@KAIST: Class Community

- **Running the community via Discord**
 - Participants should **join by 14 March**
 - Speaking english is not mandatory
- **What will happen in the community?**
 - **Notices will be announced**
 - Mentors will answer questions on lectures
 - Mentors will guide final projects
 - Mentors will provide off-site seminars
 - Participants will team up for final projects
 - Participants can make sub-groups for interested topics

Mentors

- **Roles**

- Answer question on lectures and Web3 topics
- Guide final projects
- Provide off-site seminars
- And more. **Welcome any proposals and crazy ideas!**

- **58 industry experts**

- Invite them from blockchain industry and vertical domains
- Cover all topics of Web3 and blockchain
- Full list

<http://web3classdao.xyz/kaist/mentor/>

Community Staff

- **Roles**

- Manage the community
- Help members engage with the community
- Lead the community to be active

- **Contact**

- **Discord moderator:** questions about Discord
Victor Park, leafcat92@gmail.com
- **Community staff leader:** questions about the community
MinJun Kim, minjun.kim@soonilabs.com
- **Community staff**
<http://web3classdao.xyz/kaist/staff/#community-staff-volunteer>

Mentor Office Hours

- **Office hours on discord**

- Mentors will cover Q&A on lectures and any web3 topics
- Tuesday through Friday evenings from 8pm to 12am (KST)
- Each mentor will arrange 1 hour a week
- Mentors in other time zones will set their own office hours

- **How to ask**

- Choose the right Discord channel
(development, product, business,
tokenomics, community/governance, etc)
- Ask questions without choosing a mentor (option 1)
→ some mentors who are in the office hour will answer
- Ask questions to a specific mentor by mentioning him/her (option 2)
- **!!! DON'T send Discord DMs to a mentor !!! (DM is not allowed on Discord)**
- Send an email to a mentor instead of DM (refer to the class website)

Mentor off-site seminars

- **Off-site Web3 seminars**
 - Mentors will voluntarily present Web3 topics that aren't covered in the class
 - It's not included in the regular class
 - Attendance is **completely optional**
 - **Anyone can attend**, regardless of the class
 - Mentors can limit attendance to the class community if they wish
- **Run with Orakle (KAIST Blockchain Society) together**
 - Orakle will help organize the seminars
 - The staff leader MinJun Kim(minjun.kim@soonilabs.com) is the president of Orakle

Schedule of mentor off-site seminars (Tentative)

Date/Time	Title	Speaker	Place
3/20(19:00)	Wallet types, technologies, and future developments	Minho Yoo (CSO @ IoTrust (D'CEN Wallet))	Offline (Seoul)
3/27(19:00)	L1 Blockchain Platform Governance	Younho Lee (Head of Business&Governance @ Klaytn Foundation)	Offline (Seoul)
4/3(19:00)	Web3 Mass Adoption: Game and Intra	Geon-gi Moon (CEO @ Haechi Labs)	Offline (Seoul, Haechi Labs) + Online
4/10(19:00)	Applying Web3 to offline real-world cases	William Wooseok Jang (CSO @ Allink)	Offline (Seoul)
4/17(19:00)	Web3 practices and possibilities in the advertising industry	Kyunsin Kim (CEO @ PAULUS)	Offline (Seoul)
4/24(19:00)	ReFi, Regenerative Finance	JinYoung Yoo (Core Member @ ReFi Seoul)	Online
5/1(19:00)	Introduction to Ethereum	Wanseob Lim (Technical Lead @ Ethereum Foundation)	Offline (KAIST)
5/8(19:00)	Applied Cryptography for Ethereum	Wanseob Lim (Technical Lead @ Ethereum Foundation)	Offline (KAIST)
5/15(19:00)	Zero Knowledge Proof, Layer2 and Rollup-centric Ethereum	Jihoon Park (CEO @ Radius.xyz)	Offline (KAIST)
5/18(19:00)	Starknet & ZK Rollup	Kunho Kim (CEO @ Topology)	TBD
5/22(19:00)	Creative approaches to Web3-related Intellectual Property with case studies	Kangwook Lee (Patent / Trademark Attorney @ KNK Intellectual Property & Law)	Offline (Seoul)
5/29(19:00)	How to Bring AI to Web 3.0	Minhyun Kim (CEO @ Common Computer)	Offline (Seoul)

Web3 Project Idea Board

- **Project Idea Board**

- Gathering project ideas in advance from mentors and students
- Used for matchmaking mentors and project teams
- Simple form of title, abstracts, proposer
- No worry about duplicated ideas (it's for matchmaking)
- Allowed to fork other's ideas with improvement
- If your idea is confidential, DON'T post it

- **How to run the board**

- Gather ideas through Google survey
- Share the responses Google spreadsheet in a view mode

Final Project Mentoring

- **Final projects with mentors**
 - Highly recommended to get mentored
 - Multiple mentors are allowed for a project team
 - No mentor is allowed for a project team if they want
- **Matching mentors and project teams**
 - It's up to mentors and project teams
 - Appeal yourself in the project idea board and discord
 - A project team can reach out to mentors of their choice
 - A mentor can reach out to project teams of his/her choice
 - If you need a help, please contact community staff

Hackathon/Ideathon with Final Projects

- **Running Hackathon/Ideathon**
 - Hackathon with Web3 app prototypes
 - Ideathon with Web3 startup proposals
 - Giving students chance to enhance the projects
 - Transforming outstanding projects into real apps or startups
- **How to organize**
 - The class community may organize it with other Web3 communities and companies of mentors
 - The progress will be shared on Discord
 - If you are interested in organizing Hackathon,
please contact the community staff leader

Certificates of completion

- **SBT Certificates of completion for the course**
 - Students and auditors who passed the course by working on a final project
 - No project, no certificate
 - Not an official certificate from KAIST,
but a community certificate issued by Jason
 - It will be issued by SBT, Soulbound Token, which is non-transferable NFT
 - It will not carry any monetary benefits and cannot be traded
 - It can be used as proof of course completion

Rewards for outstanding projects

- **SBT Awards for top projects**
 - Award top projects with SBT
 - Top 3 projects in web3 app prototypes (option 1)
 - Top 3 projects in web3 startup proposals (option 2)
- **Chance to present projects**
 - Awarded top 3 projects in option 1 and 2 will present in the last lecture
VC will join and comment
 - If a project team want to build a startup, VCs will help them potentially
- **Mentoring chat with Jason**
 - Awarded top 6 projects will have a chance to meet Jason
 - If a project team want to build a startup, Jason will help them

Rewards for outstanding community members

- **SBT Awards for top community members (students, auditors)**
 - Award top 5 community members with SBT
 - The selection process will be announced later
- **Coffee chat with Jason**
 - Awarded top 5 members will have a chance to meet Jason

Rewards for outstanding mentors

- **SBT Awards for top mentors**
 - Award top 3 mentors with SBT
 - The selection process will be announced later
- **Coffee chat with Jason**
 - Awarded top 3 mentors will have a chance to meet Jason

Notice

- **Students should join Discord by 14 March**
 - Leave a brief intro on the #self-introduction channel
- **This presentation material will be shared on Discord**
- **Q&A session about the class on Discord today night**
 - 9pm – 11pm today (8th March)
 - I'll be waiting on the channel #class-faq
 - This is called as AMA (Ask me anything) in the blockchain space

Notice

- **Recommend taking the survey. (by Wed 15th March)**
 - You need to install a Metamask wallet in a chrome browser
 - You need to connect the wallet to Polygon and Klaytn
(with the same address as Ethereum)
 - Put the address to the survey
 - Jason will send your address 10 MATIC(Polygon) and 40 KLAY(Klaytn)
so you can try it out. That's a total of \$19.1 (\$25,000)
(At 11pm on March 8th, MATIC is at \$1.11 and KLAY is at \$0.2)
 - Jason will send them in batches on the 16th and 17th March.
 - This applies to every community members

Q & A

**[Reminder] 9pm – 11pm today, Q&A session about the class
on Discord the channel #class-faq**