九州大学学術情報リポジトリ
Kyushu University Institutional Repository

INTEGRATING OML(ONLINE MACHINE LEARNING) AND CEP (COMPLEX EVENT PROCESSING) FOR BETTER CPSS (CYBER-PHYSICAL-SOCIAL SYSTEMS)

Murakami, Kazuaki
Institute of Systems, Information Technologies and Nanotechnologies

https://hdl.handle.net/2324/1398522

出版情報：SLRC プレゼンテーション, 2013-11-29. 九州大学システムLSI研究センター
バージョン：
権利関係：

Integrating OML (Online Machine Learning) and CEP (Complex Event Processing) for Better CPSS (Cyber-Physical-Social Systems)

Nov. 29, 2013

Kazu J. Murakami
Kyushu University
murakami@ait.kyushu-u.ac.jp

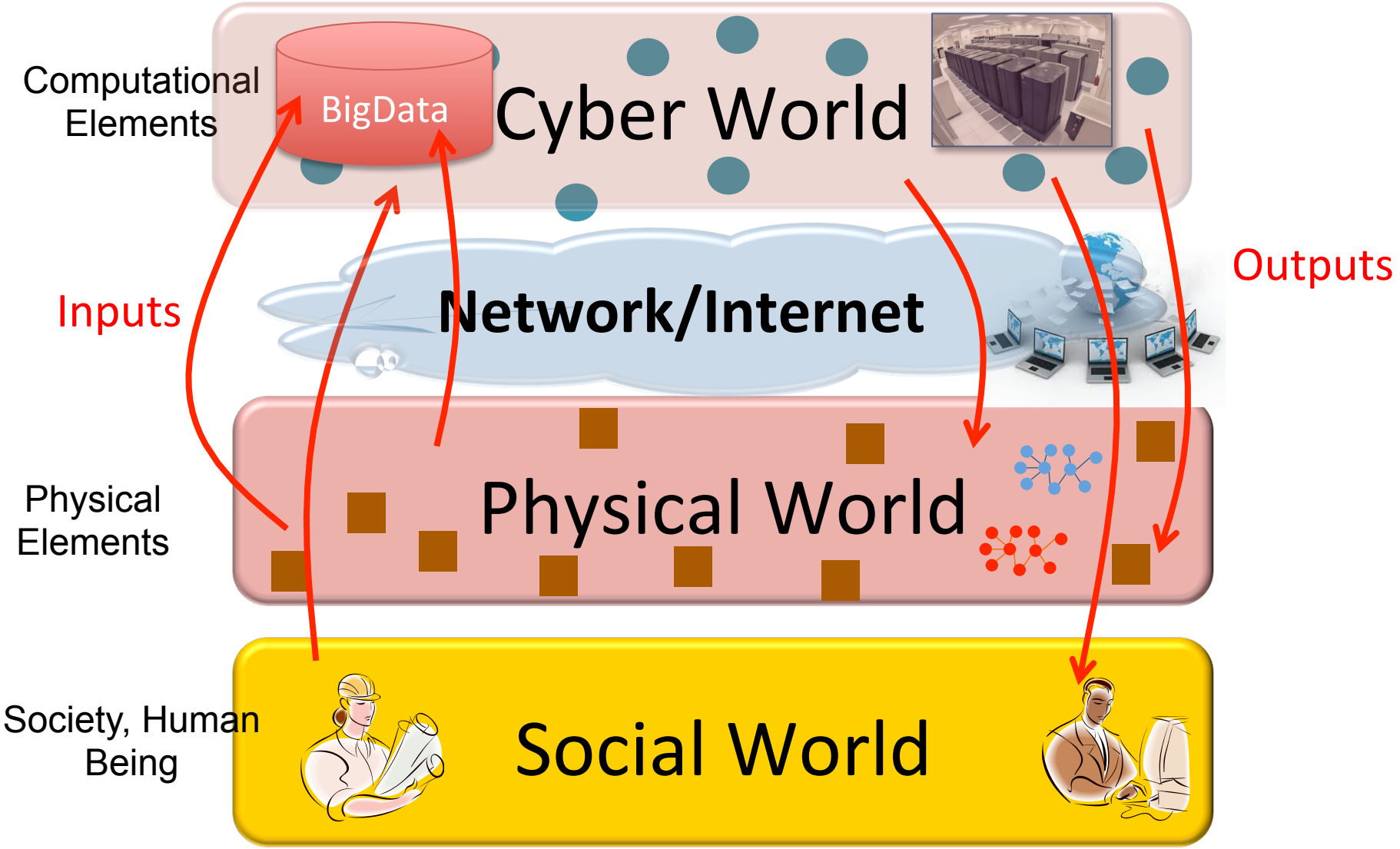
OUTLINE

- What are CPSS (Cyber-Physical-Social System), OML (Online Machine Learning), and CEP (Complex Event Processing)?
- Why do we integrate OML and CEP for better CPSS?
- How do we integrate OML and CEP for better CPSS?
- Where shall we experiment?

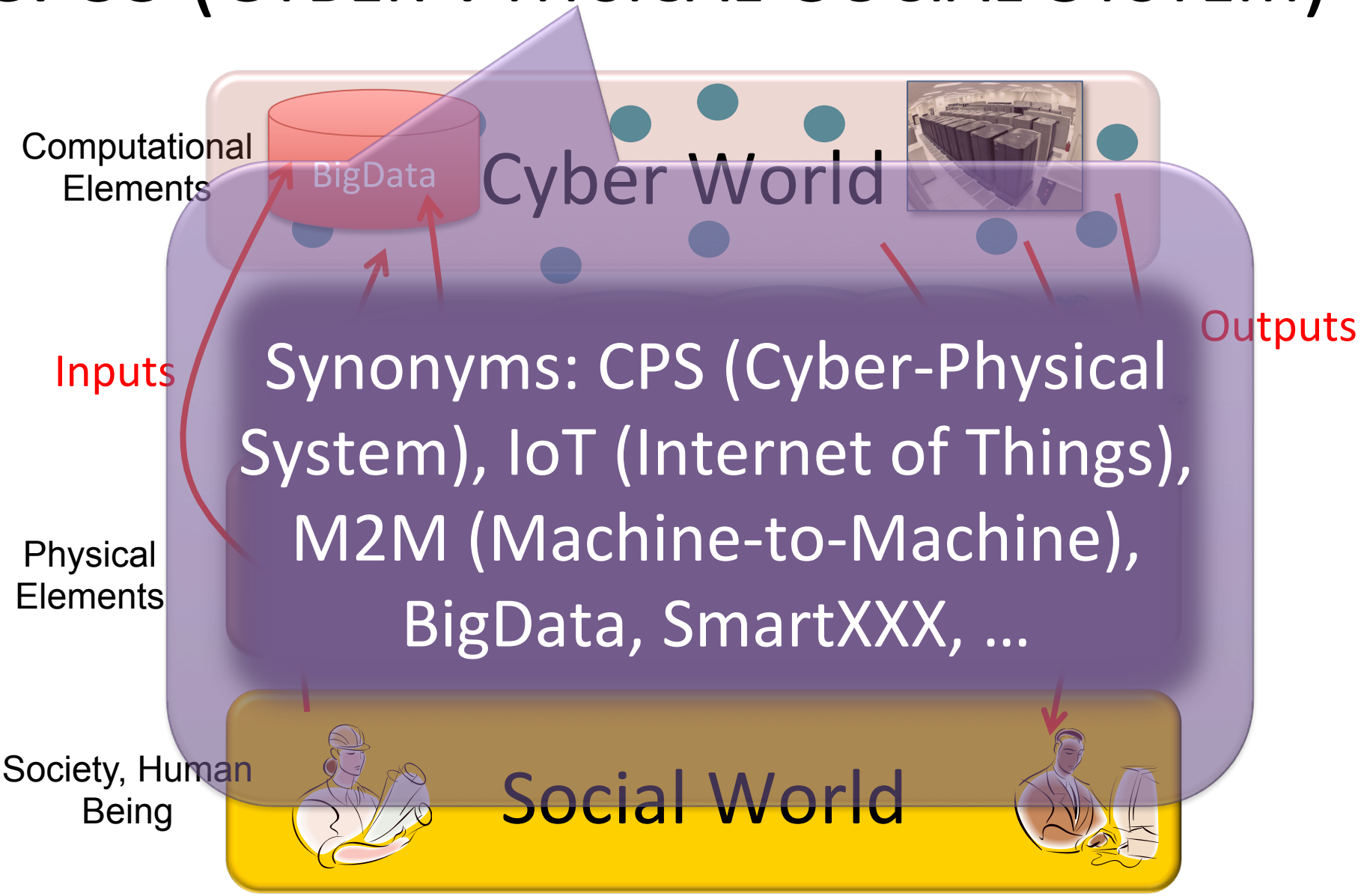
Part I

WHAT ARE CPSS, OML, AND CEP?

CPSS (CYBER-PHYSICAL-SOCIAL SYSTEM)

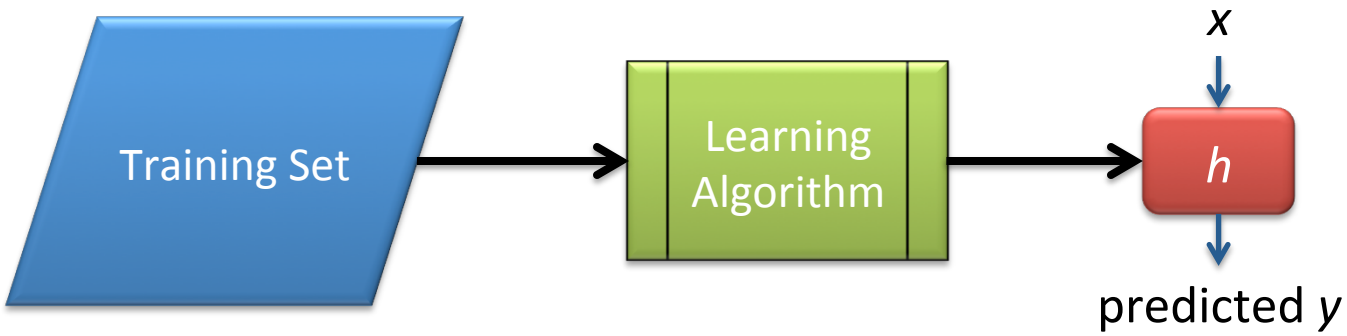


CPSS (Cyber-Physical-Social System)

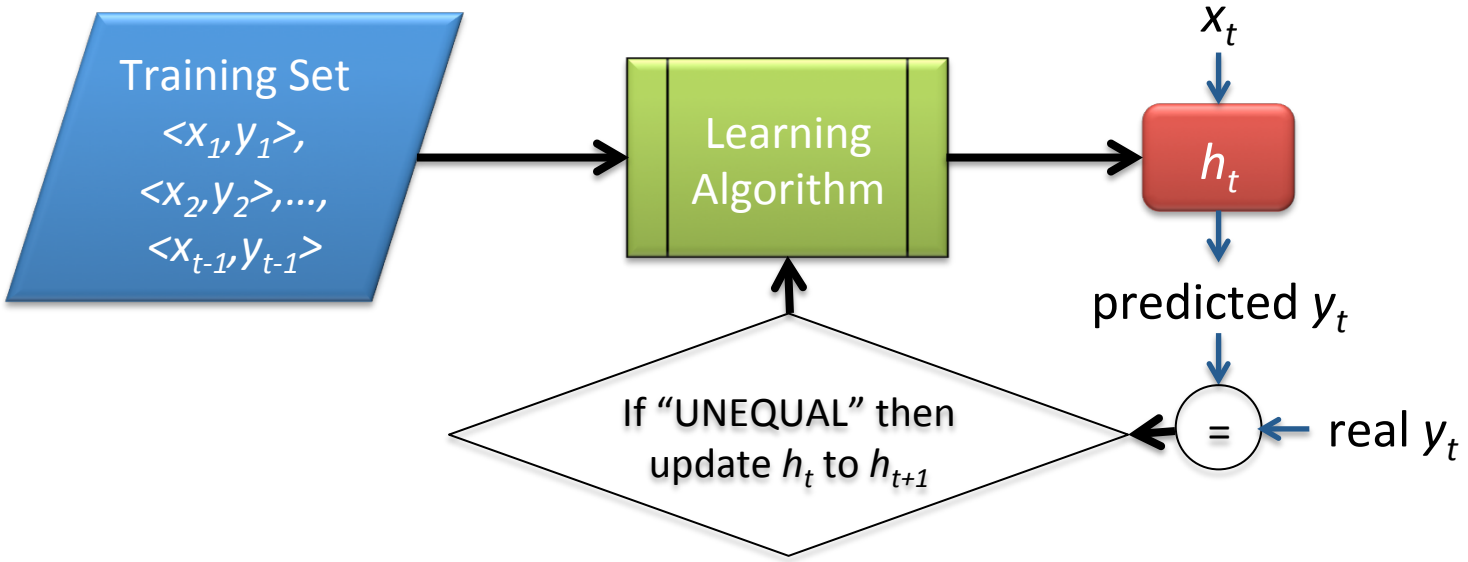


OML (Online Machine Learning)

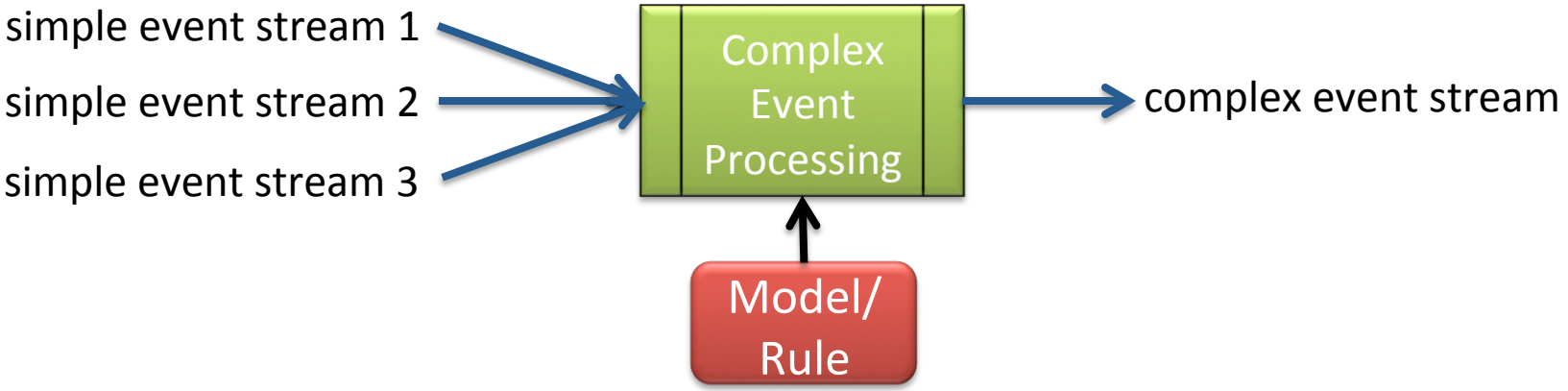
- BML (Batch Machine Learning)



- OML (Online Machine Learning)



CEP (Complex Event Processing)



An example:

Event1: church bells ringing
Event2: the appearance of a man in a tuxedo with a woman in a flowing white gown
Event3: rice flying through the air

Complex event: a wedding

Part II

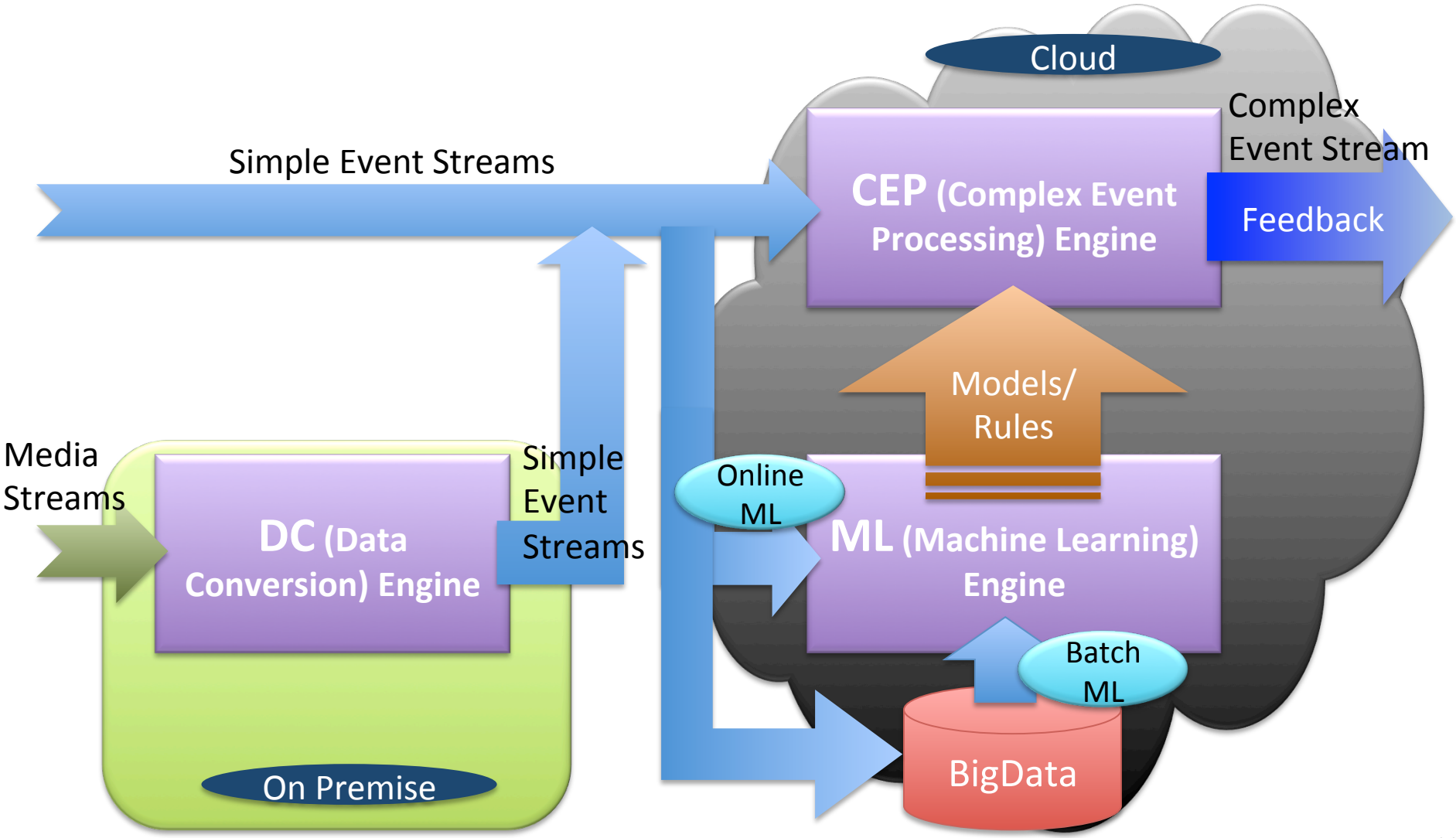
WHY DO WE INTEGRATE OML AND CEP FOR BETTER CPSS?

CPSS (CYBER-PHYSICAL-SOCIAL SYSTEM)

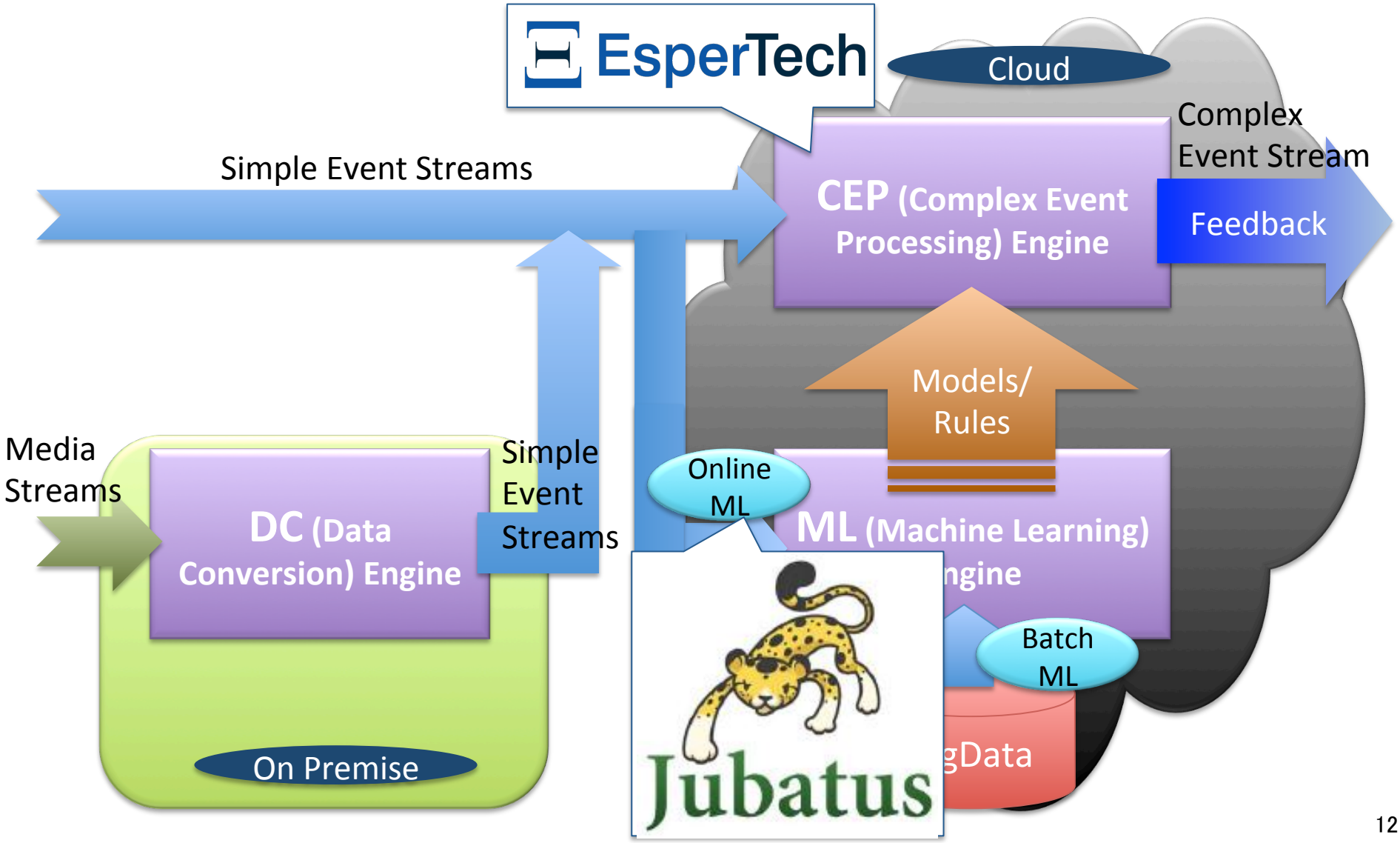
Part III

HOW DO WE INTEGRATE OML AND CEP FOR BETTER CPSS?

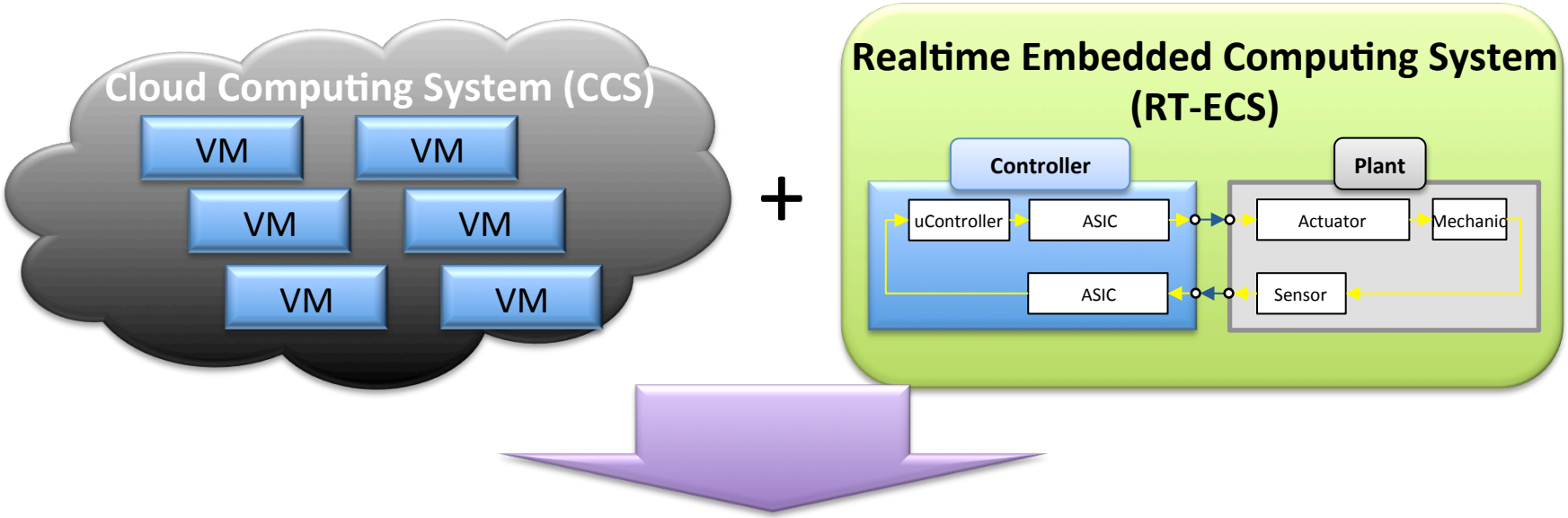
A Platform Architecture for CPSS



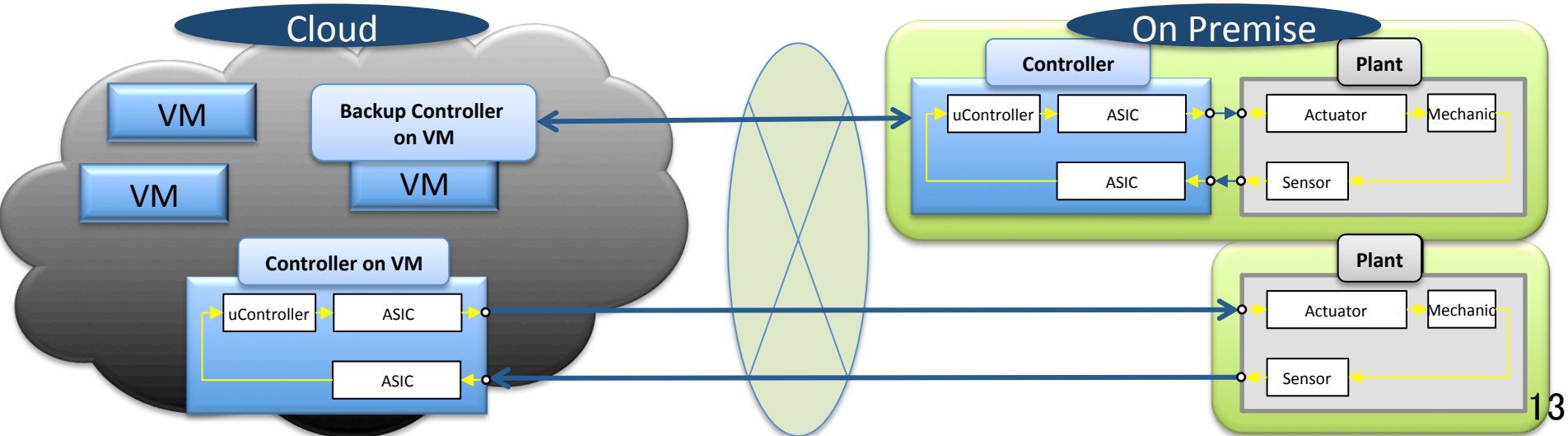
A Platform Architecture for CPSS - A Software Perspective -



A Platform Architecture for CPSS
- A Hardware Perspective -



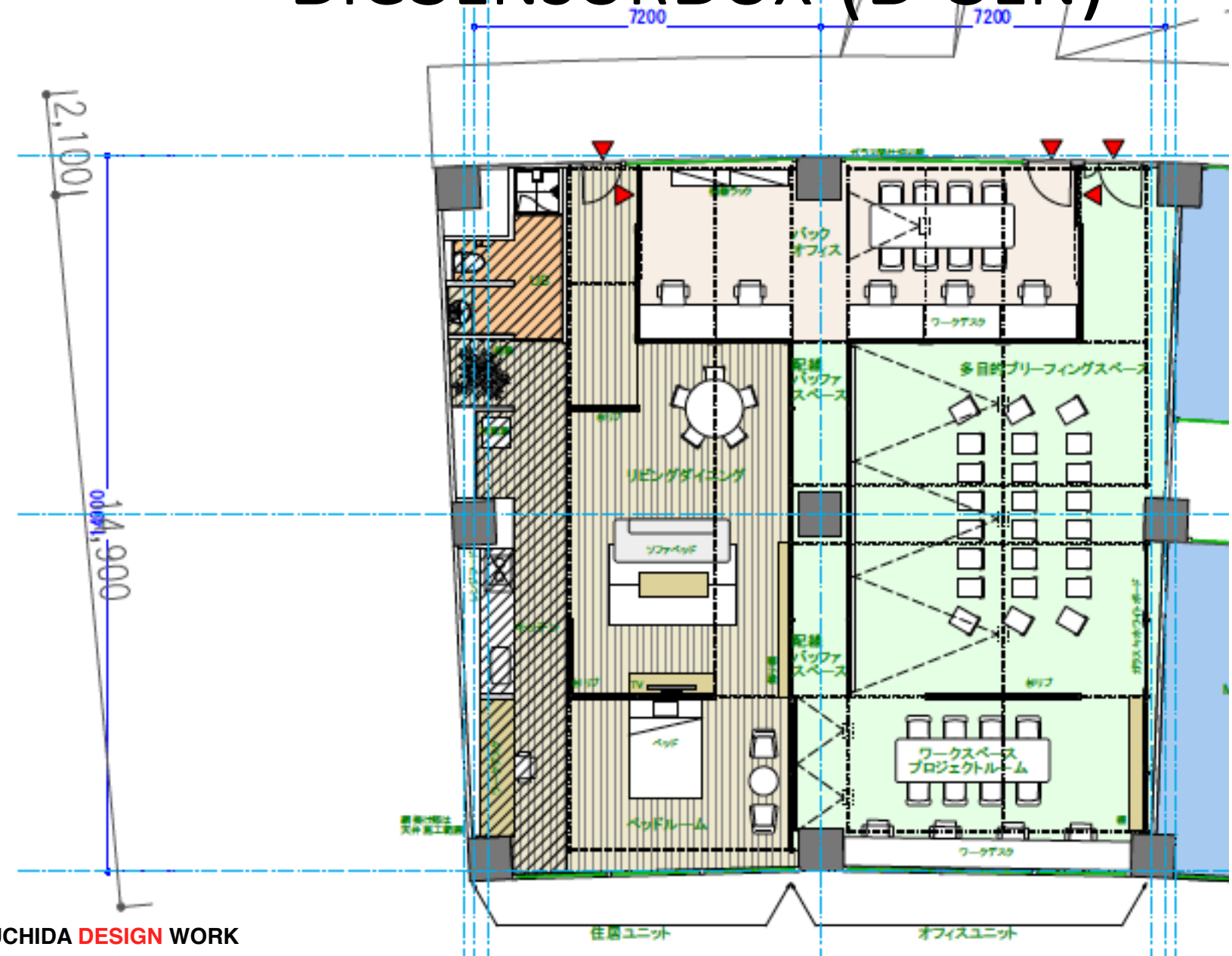
RT-ECCS (Realtime Embedded Cloud Computing System)



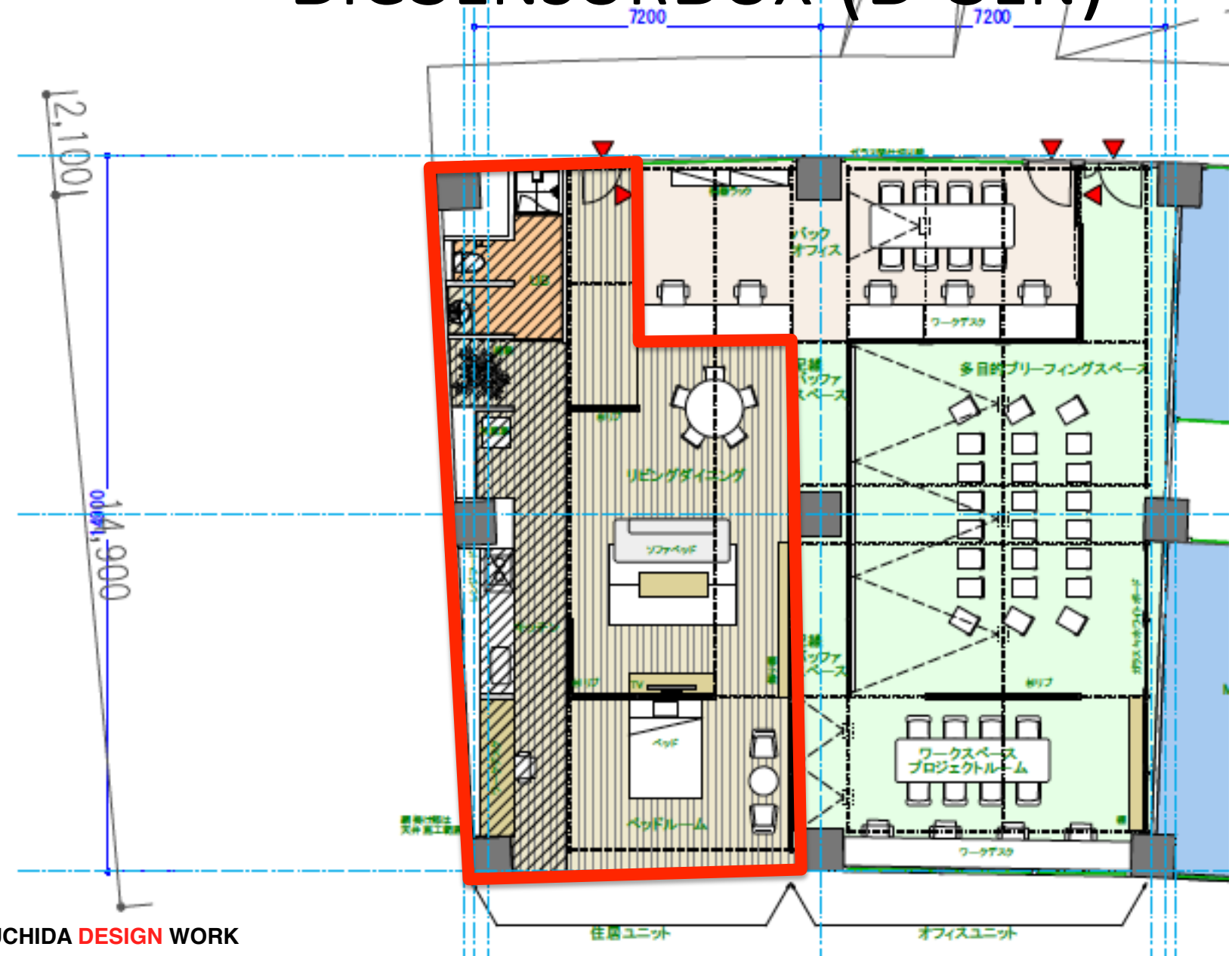
Part IV

WHERE SHALL WE EXPERIMENT?

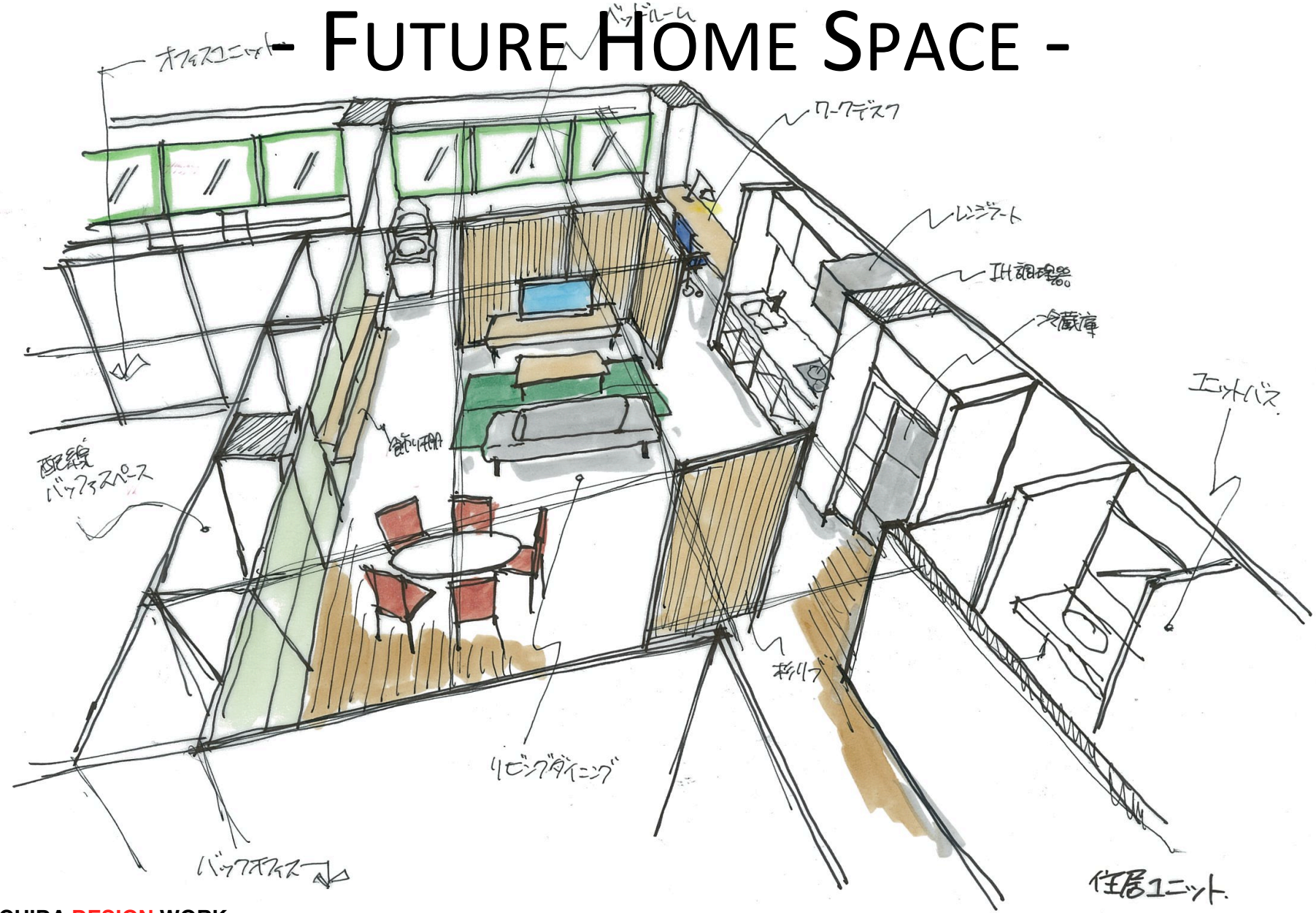
BIGSENSORBOX (B-SEN)



BIGSENSORBOX (B-SEN)



BIGSENSORBOX (B-SEN)
- FUTURE HOME SPACE -



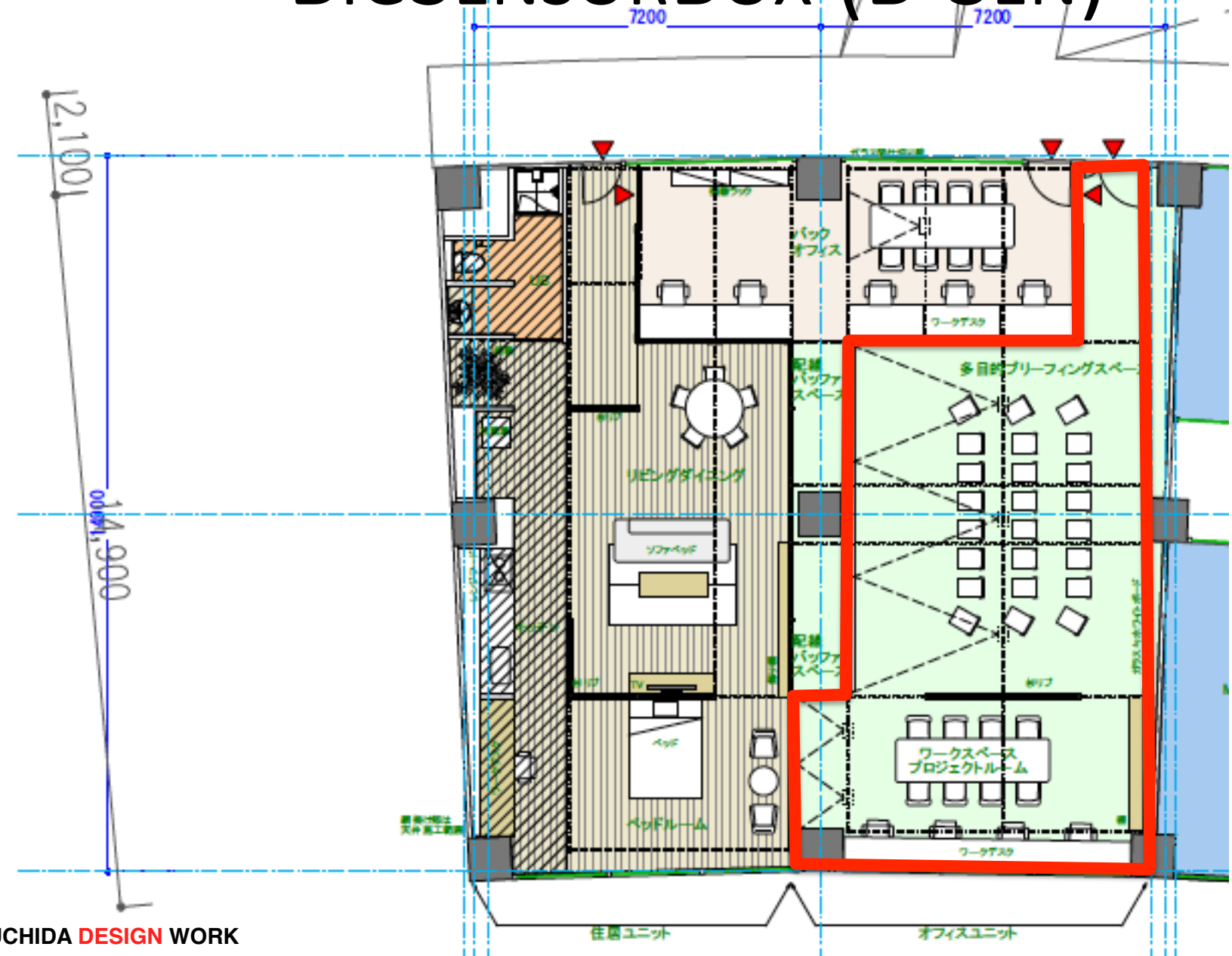
FUTURE HOME IMAGE

UCHIDA DESIGN WORK

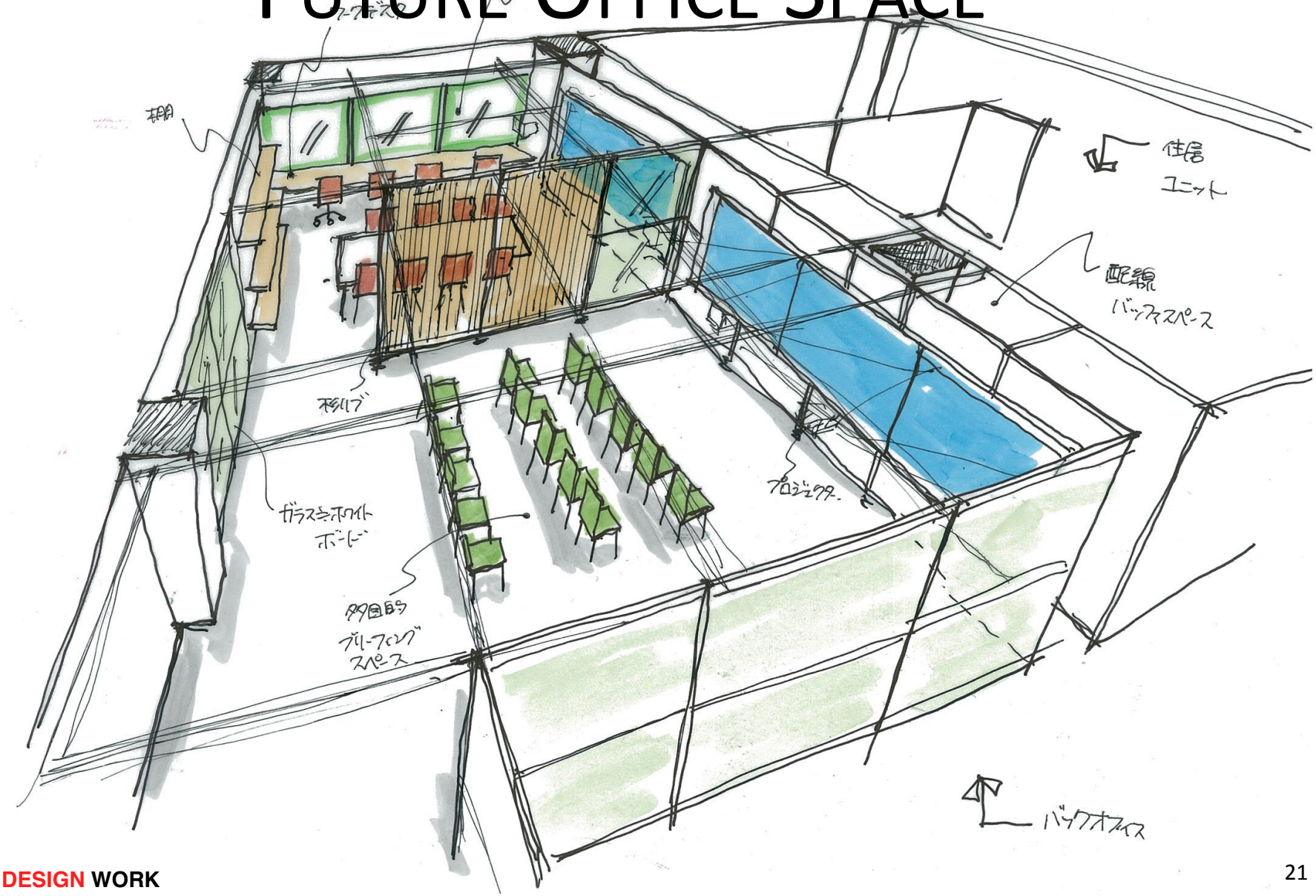
FUTURE HOME IMAGE

UCHIDA DESIGN WORK

BIGSENSORBOX (B-SEN)



BIGSENSORBOX (B-SEN)
- FUTURE OFFICE SPACE-

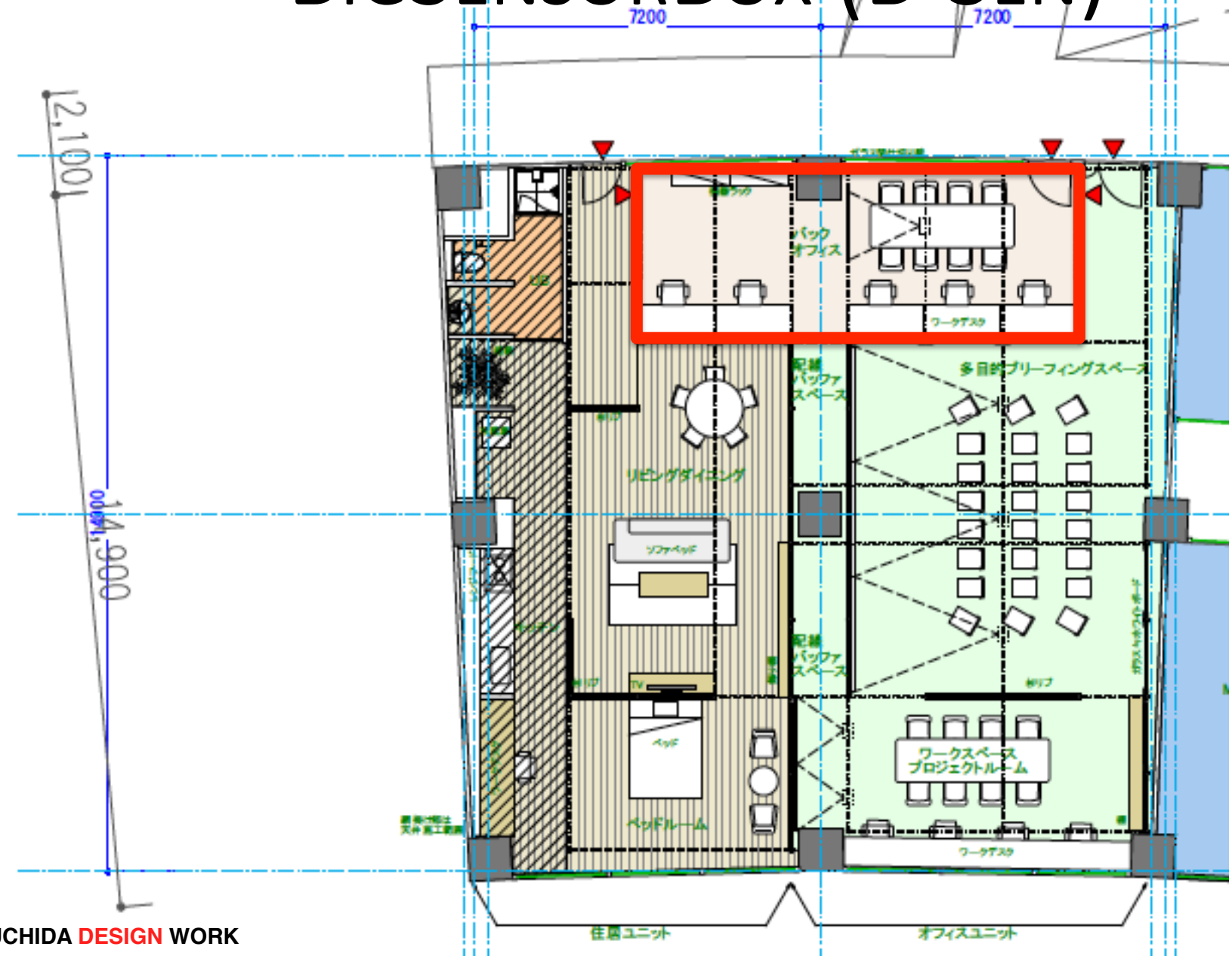


FUTURE OFFICE IMAGE

UCHIDA DESIGN WORK

FUTURE OFFICE IMAGE

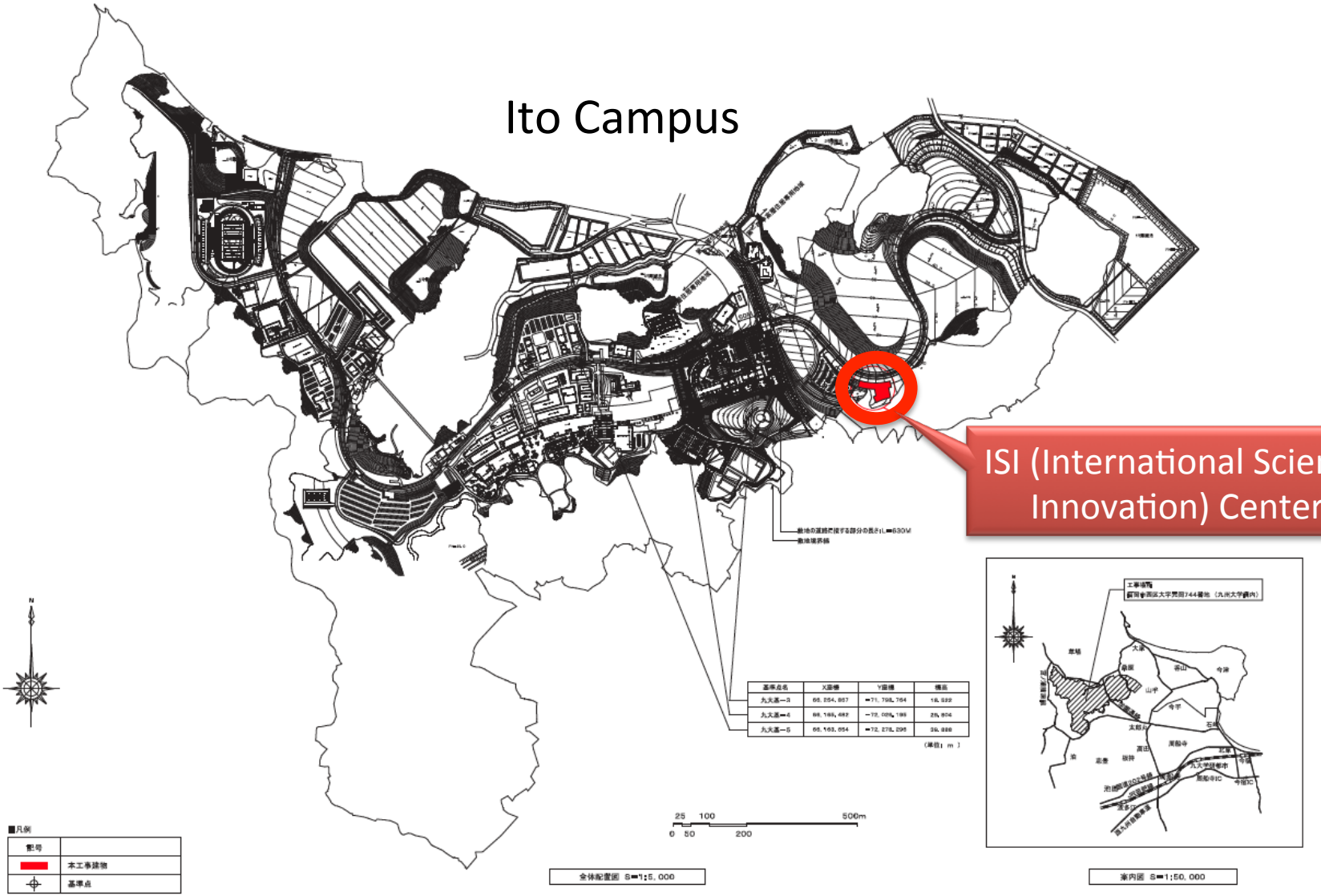
BIGSENSORBOX (B-SEN)



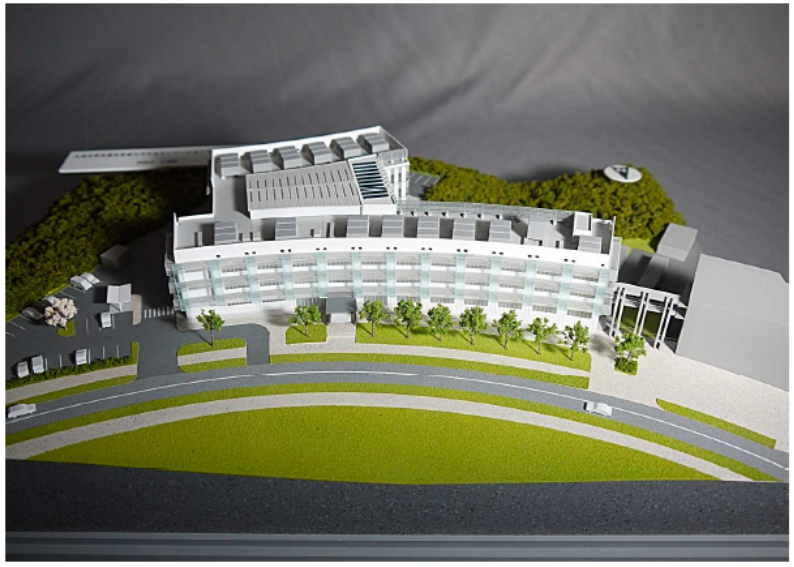
BACK OFFICE (DATA SCIENTIST ROOM)

UCHIDA DESIGN WORK

WHERE IS THE B-SEN?



ISI (International Science Innovation) Center



ISI (International Science Innovation) Center

SUMMARY

- What are CPSS (Cyber-Physical-Social System), OML (Online Machine Learning), and CEP (Complex Event Processing)?
- Why do we integrate OML and CEP for better CPSS?
- How do we integrate OML and CEP for better CPSS?
- Where shall we experiment?