

Intelligent Automation System in Autonomous Chemistry Lab

Tianwei Dai

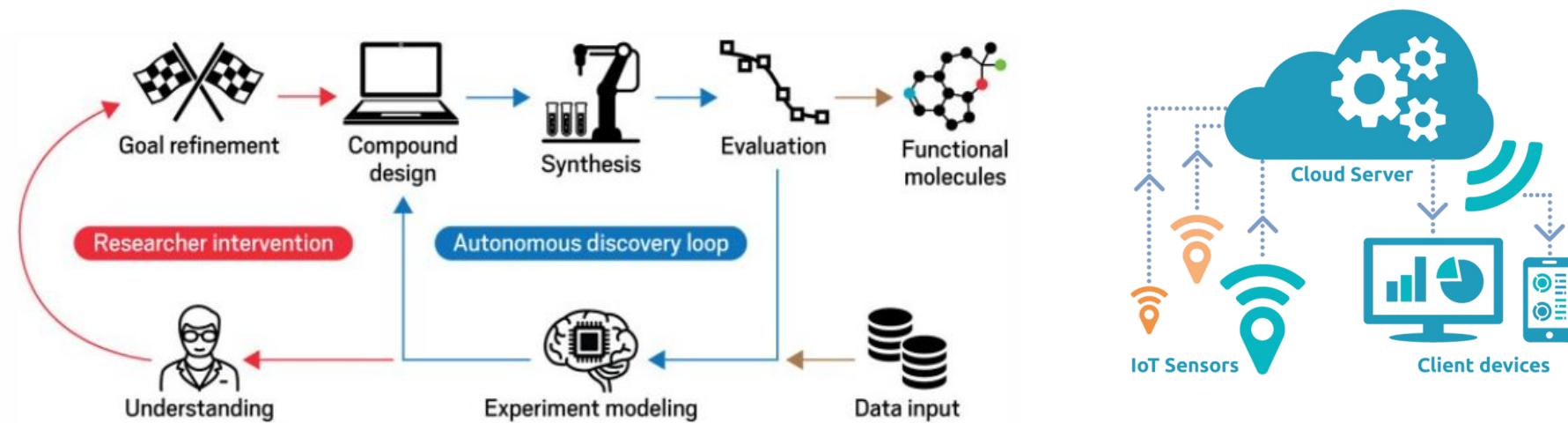
Cooper Group
The University of Liverpool

- *Overview*
- *Automation (IAS)*
- *Case study*
- *Conclusion*

Intelligent Automation System:

Intelligent Automation System (IAS) is a combination of Robotic Process Automation (RPA) and Artificial Intelligence (AI) technologies which together empower rapid end-to-end process automation and accelerate digital transformation.

Certainly, it would make a huge impact on chemistry automation.



Intelligent Automation System:

Intelligent Automation System (IAS) can be divided into two main parts: Automation and AI.

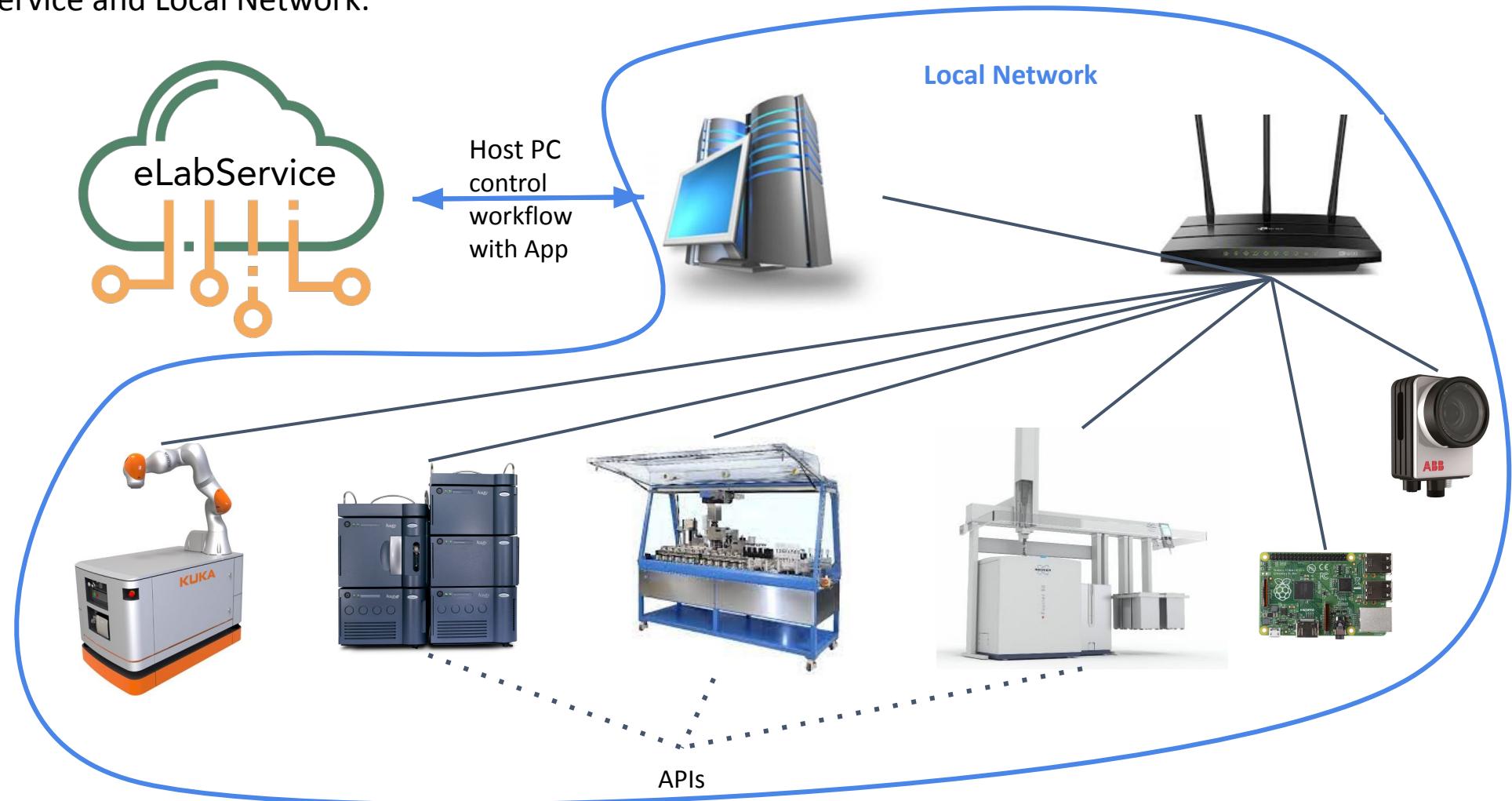


Smart entities in Autonomous Chemistry Lab (ACL):



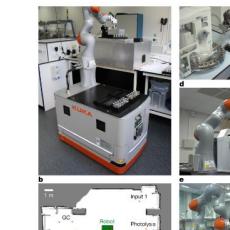
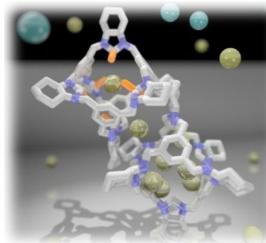
Network Architecture in ACL:

—Cloud Service and Local Network:



eLabService for ACL:

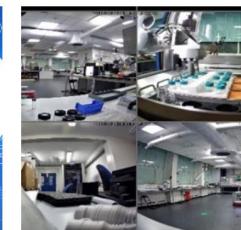
—Perform lab activities remotely, research data management, CCTV, etc.:



Lab Activities



Data Management



CCTV

eLabService for ACL:

—Perform lab activities remotely, research data management, CCTV, etc.:



Robotic Workflows

Perform Predefined Workflows



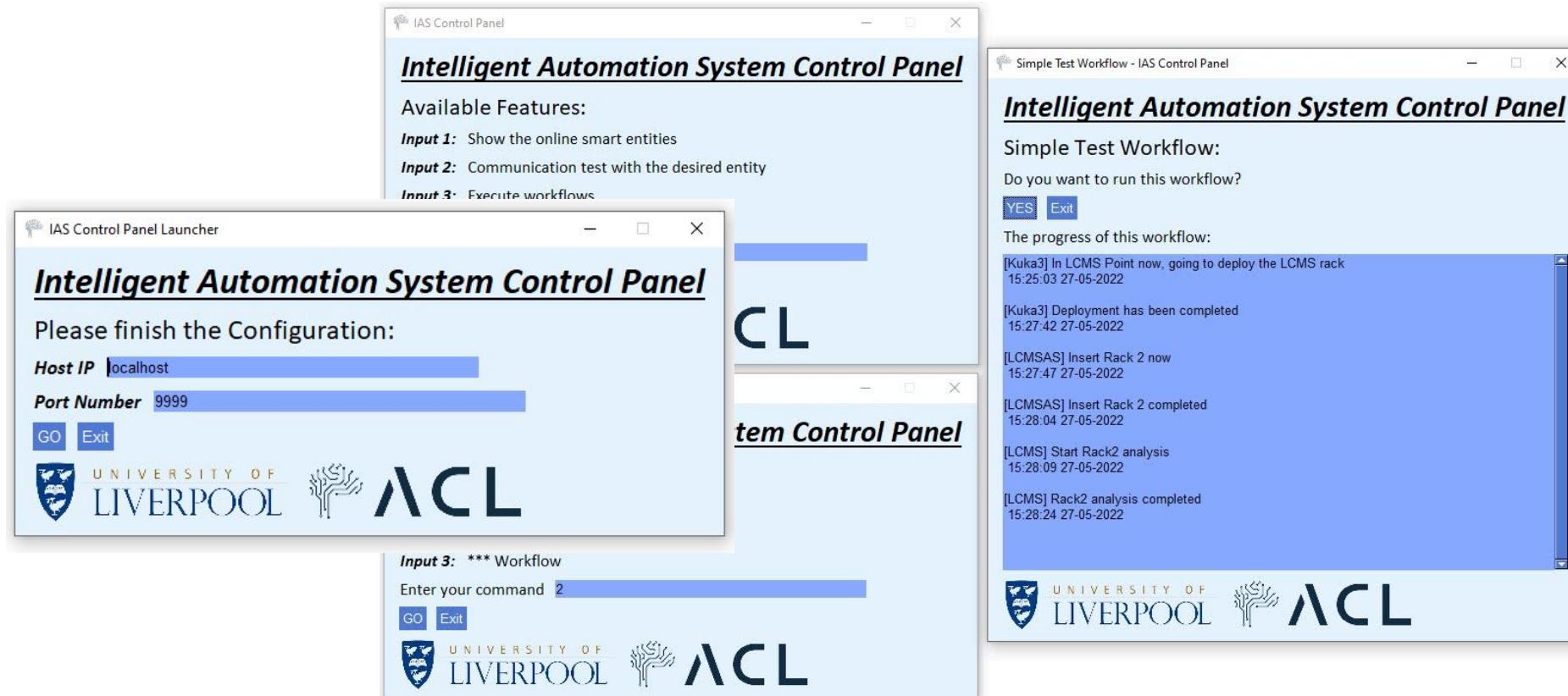
Online Lab Equip
Management

Communication Test

Automation(IAS) in ACL:

—Intelligent Automation System Control Panel (App):

This App could run on most Windows 10 PC, no other dependencies are required.



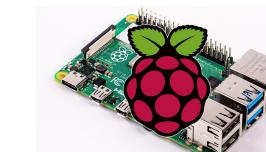
Automation(IAS) in ACL:

—Kuka works with LCMS:

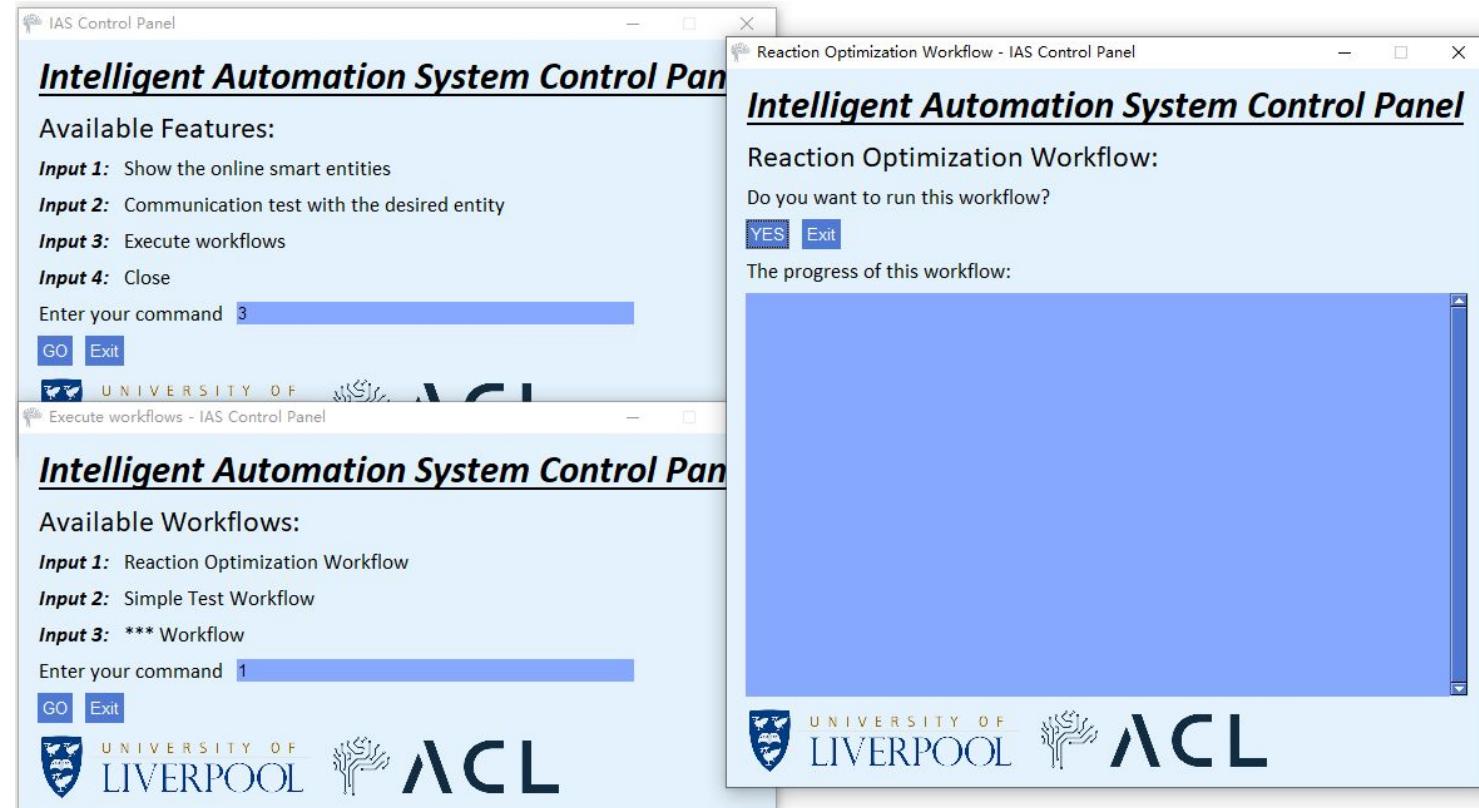


Automation(IAS) in ACL:

—The closed-loop Chemspeed and Kuka implementation:



Demo video for parts of the robotic workflow:



Thank you