☆ The 20th Anniversary ☆
 Asia Navigation Conference 2022
 Navigation and Port Research for the Next Generation in ASIA -

# Autonomous vessel technologies as a means



05 November 2022

#### Purpose and Goals of autonomous vessel technologies



#### Navigation support system



## **AR navigation system**

### **Object recognition**



## Image detection by AI

https://www.youtube.com/watch?v=7lRdH86G\_f8

#### Navigation monitoring system



Calculating grounding risk with the data available by anybody, and make people aware it

https://www.mol.co.jp/pr/2022/img/22008.pdf

#### Differences between autonomous ships and conventional ships



#### MEGURI 2040 project fieled test 1 (car ferry)



#### **MEGURI 2040 project fieled test 2 (container vessel)**



**MEGURI 2040 project fieled test 2 (movie)** 





- •Auto tracking for planned passage route
- Object recognition
- Collision avoidance
- Auto berthing and unberthing
- Mooring operation support by UAV



- vessel position, direction, heading, COG, speed...
  ENC
- Live video

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weather information

# A) Sensing

- image detection
- sensor fusion
- new sensor
- B) Planning
  - making route considered the sense of seafarer
  - making route tool into account of navigation rules
- C) Maneuvering
  - timing of decision making
  - auto tuning for disturbance
- D) Communication
  - between and among vessels
  - between vessel and VTS
  - between other shoreside people (operator, supplier, receiver, PSC···)



# Thank you !

# <complex-block>