Abstract
New software framework, DARUMA was developed to provide staffs and users friendly system for control system of X-ray experimental stations. DARUMA utilizes MADOCA used for controls of SPring-8 accelerator, and also provides general software tools for stations. DARUMA has merits to reduce maintenance costs and reuse basic software.

Demands on experimental stations at SPring-8
- Easy reconfiguration to update experimental setup
- Rapid preparation of measurement software
- Easy to reuse basic software tools

But time and costs are required for setup and difficulties in reuse of software due to current monolithic application in stations at SPring-8

Solution with DARUMA
✓ Separated software processes for each function with MADOCA
   • Used for distributed controls in SPring-8 accelerator and beamline
   • Useful features of MADOCA for stations:
     Interface with LabVIEW, Python
     Messaging with variable length data (Image etc.)
     Facilitate reconfiguration to update experimental setup

✓ Developed general software tools for stations
   • Equipment Manager (EM) for 2D detector, trigger, motor etc.
   • Data collections, image handling
   • Command procedure for measurements
     Easy to plugin for improved measurements

Staffs and users can concentrate on experimental procedure with user interface

DARUMA into SPring-8 BL stations
✓ BL03XU (soft material beamline)
   • Being smoothly replaced with DARUMA
   • Ready : EM, Data collection, Image handling

✓ Other experimental stations at SPring-8
DARUMA was implemented for partial set of the control system:
EM of 2D detector, motors and Image handling (Live view, Image integrated sum)
  ➔ BL08W, BL13XU, BL14B2, BL19B2, BL46XU since this September

✓ Data logging
   • Collected detector data is archived with elasticsearch
   • ~10 Hz, M pixel image
   • With meta data in measurement, voltage etc.
   • For image data, path on the storage server is recorded

✓ Data handling
   • Image data is transferred with message
   • Live view with PyQT (pyqtgraph)
     A few Hz for M pixel image data
   • Image analysis through control EM
     Image integrated sum (ROI)

✓ Image handling
   • Collected detector data is archived with
     elasticsearch
   • ~10 Hz, M pixel image
   • With meta data in measurement, voltage etc.
   • For image data, path on the storage server is recorded

✓ Web portal for viewer or detector data
• Full-text search (Japanese) using elasticsearch

Summary and Plan
• DARUMA for station software framework was developed and being applied to several stations at SPring-8
• Plan: Improve image handling tools, documents and installers to promote DARUMA into stations at SPring-8
  ➔ Willing to complete DARUMA by drawing right eye!

References