AUTO-X:

Autonomous biomonitoring - A citizen science project to monitor water quality under the influence of climate change

Ostfalia
Hochschule für angewandte Wissenschaften

University of Wisconsin Parkside

ZWIRN

Hydroguard UG https://hydroguard-iot.de/

Algae App LLC

Lack of oxygen: Vicious circle in the lake

Stand: 02.02.2024 10:25 Uhr

Once lakes have too little oxygen, it is hard to bring them back to a good condition. This is often caused by nutrients from agricultural runofff during increasingly vicious rainfall events due to climate change effects.

AUTO-X:

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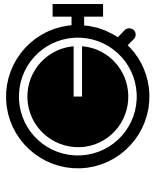
Climate Change,
Extreme Weather Conditions

Warming of Lake Water

Toxic algal blooms,
fish kills,
habitat alteration,
food poisoning

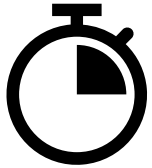
Human health
and well-being

Traditional Monitoring

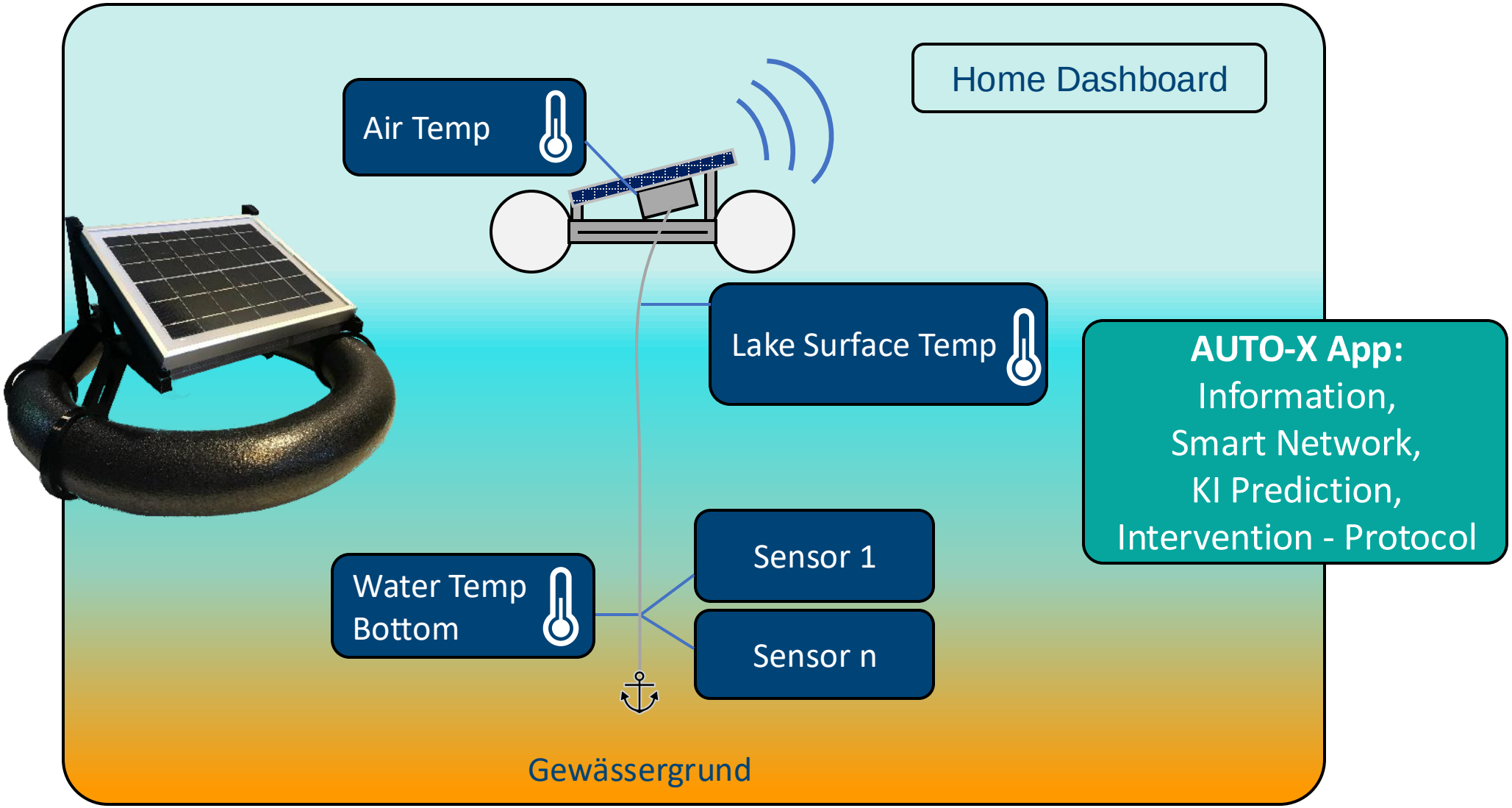


- Labor-intensive Manual Sampling
- Time allowance for Onsite Sampling
- Laboratory Analysis
- Expert Evaluation
- Cost-intensive Equipment
- Status Assessment

Autonomous Real Time Monitoring: HYDROGUARD



- Autonomous Automated Data Acquisition
- Efficient LoRaWAN Transmission
- Dashboard and Real-Time Information
- Detection: Manipulation, Damage
- Design: Cost-efficient, Environmentally-friendly
- KI: Prediction
- Crisis Intervention Protocol
- **Citizen Sciences: Smart Network**


Home Dashboard
Air Temp
Lake Surface Temp
Water Temp Bottom
Sensor 1
Sensor n
AUTO-X App:
Information,
Smart Network,
KI Prediction,
Intervention - Protocol
Gewässergrund

AUTO-X: Join and work both ways

AUTO-X
Citizen Sciences App:

- Attractive
- Interactive

Institutions
Home Dashboard

Information,
Smart Network,
KI Prediction,
Intervention - Protocol

AUTO-X: What we need for Citizen Sciences

Web – App (Browser):

User Benefits and Incentives: Why should I play?

- Gamification:
  - Pokemon Go -> Pokestop at the Buoy
- Voucher:
  - For local stores (List to be negotiated with the town in question)
- Information:
  - FAQ about HAB [see old Storyboard]
  - Local Lake/River Information [brief Text]

AUTO-X: What we need for Citizen Sciences

App Output: What can I learn?

- Buoy/Location
- Buoy Data:
  - Temperature (Air and Water),
  - Traffic Light Warning (AI Prediction)
- Weather Data:
  - Closest Station, Precipitation (Weather API)
- Copernicus Sentinel Satellite Data:
  - Satellite Image of Location
  - last NDCI Chlorophyll Index

AUTO-X: What we need for Citizen Sciences

User Input: What can I contribute?

- Image of the Buoy (targetpoint in camera with QR Code) and surrounding water including Metadata (Location/Time)
- Beach description:
  - Visual:
    - Beach: Scum – No Scum
    - Water Clarity: Can see the bottom – Can not
    - Dead Fish: Yes - No
  - Odor:
    - neutral – smelly

AUTO-X: What you start with

- Getting into the Spirit: Information to the Public (Leaflet)
- Joining the Team: Learn more about the AUTO-X Project
- Sipping the Science: Project Publications
- Depicting the Scene: Image Library
- Diving into the Web:
  - UWP App Factory: https://appfactoryuwp.com/projects/algae-app
  - Social Media / Video Link: https://youtu.be/Ac6tzjYrraQ
  - SME: https://hydroguard-iot.de/
- Inventing New: Old Story Board
- Asking Questions: We are out there – contact us!

Yes, we can: Vote for Auto-X