PROPOSTA DI UN NASO ELETTRONICO PER VALUTARE LA QUALITÀ MICROBIOLOGICA DELL'ACQUA

Convegno Regionale della Società Italiana di Igiene - Sezione Emilia Romagna

ACQUA E SALUTE: responsabilità e innovazione nel monitoraggio e gestione delle acque destinate al consumo umano

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INO-CNR ISTITUTO NAZIONALE DI OTTICA

Sommario..

- Applicazioni in campo Alimentare → Acqua
- S3 Device (NASYS srl)
- Preparazione dei campioni
- Risultati
- Lavori Futuri

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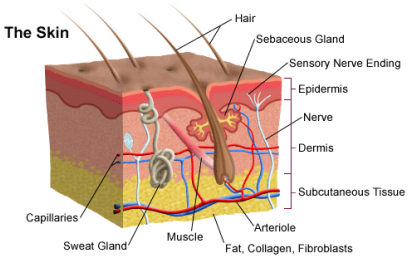
Applicazioni ..

- Controllo qualità
- Caratterizzazione
- Autenticità
- Salute
- Processi Industriali
- Automobilistico
- Militare



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SMART CONSUMERS

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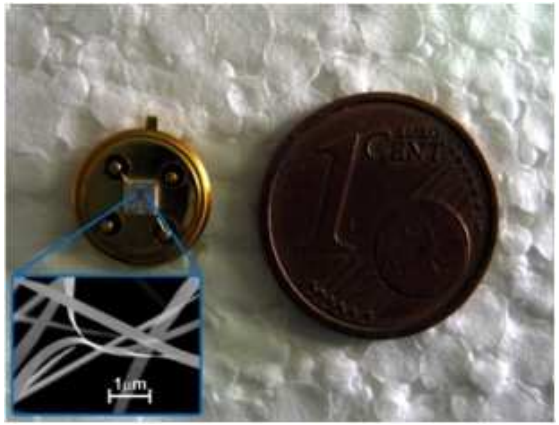
S3 DEVICE

Nano Sensor Systems S.R.L. **(NASYS)**
SPIN-OFF Università di Brescia

- Portatile
- Personalizzabile (alimentare, salute umana, automobilistico, ambientale, etc).
- Basso Consumo energetico
- Velocità di campionamento
- Stabile
- Economico



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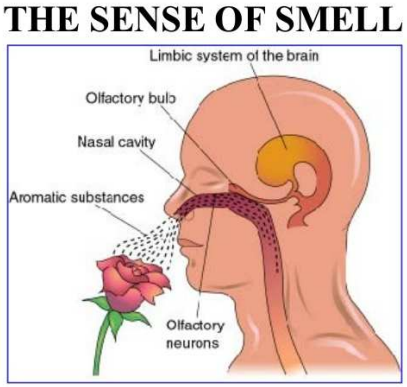
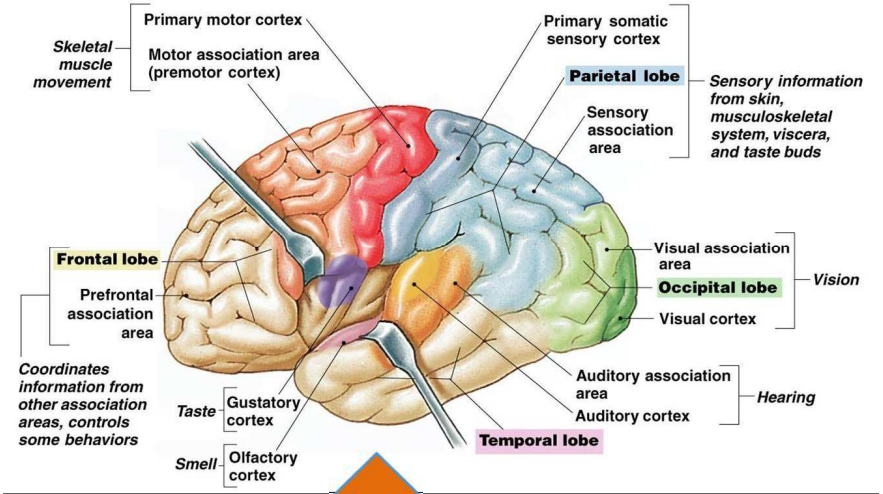
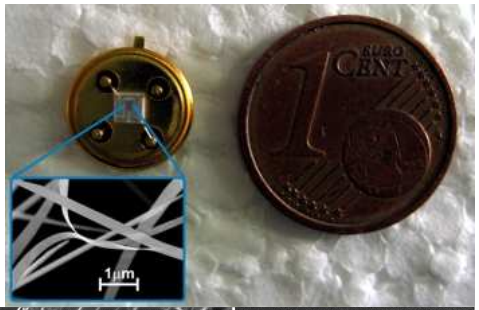
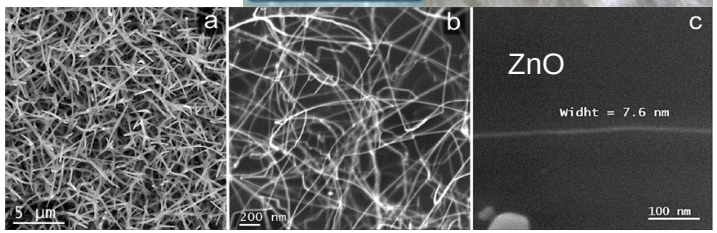
S3 Vs Naso Umano:





VOC





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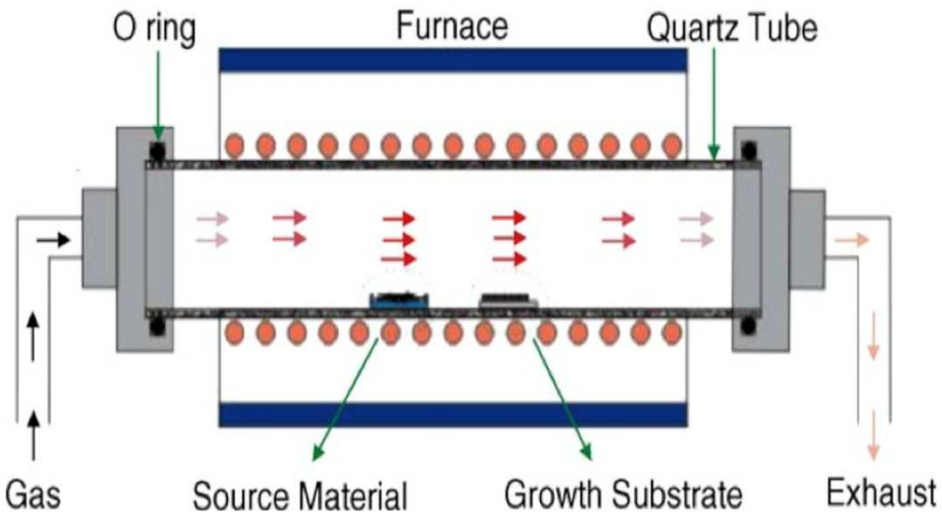
Vapor transport: tubular furnace

- Deposition by evaporation in controlled environment
  - Catalyst free
  - Catalysts assisted

- Control of NWs diameter, lenght and phase
- Study of catalyst influence on NWs growth
  - Size, morphology, crystallographic phase…
  - NWs composition



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Packaging of MOX NanoWire (Nw) sensors

For functional characterization 99% purity Alumina1x1mm was used as substrate.

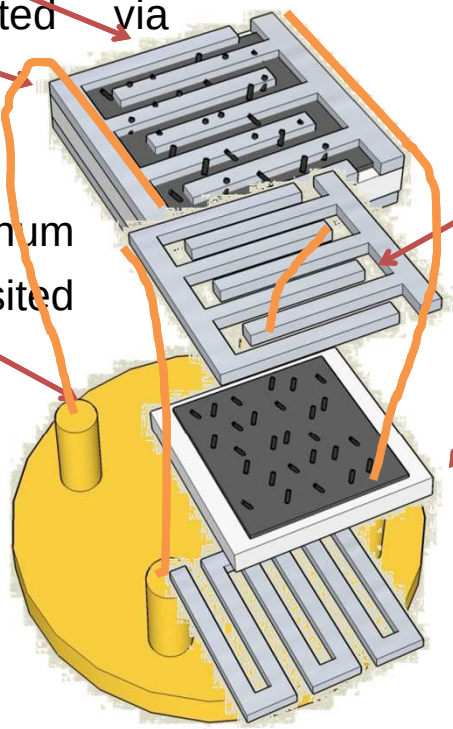
Sensing layer

Ti-W pads + Platinum contacts

Interdigited contacts and heater (300nm) deposited via Sputtering

Gold Wires

Ti-W pads + Platinum heater (300nm) deposited via Sputtering



Sensing Layer on Alumina substrate

TO Package

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SENSOR	OPERATING TEMPERATURE (°C)	COMPOSITION	DESCRIPTION
1	245	SnO_2 – MoO_2	RGTO sensor made of a blend of Tin and Molybdenum oxides.
2	280	ZnO	Nanowire sensor made of Zinc oxide
3	375	SnO_2	Nanowire sensor made of Tin oxide
4	400	SnO_2 // Ag	RGTO sensor made of Tin oxide catalyzed with silver
5	500	ZnO	Nanowire sensor made of Zinc oxide
6	500	SnO_2 –WO_3	RGTO sensor made of a blend of Tin and Tungsten oxides.

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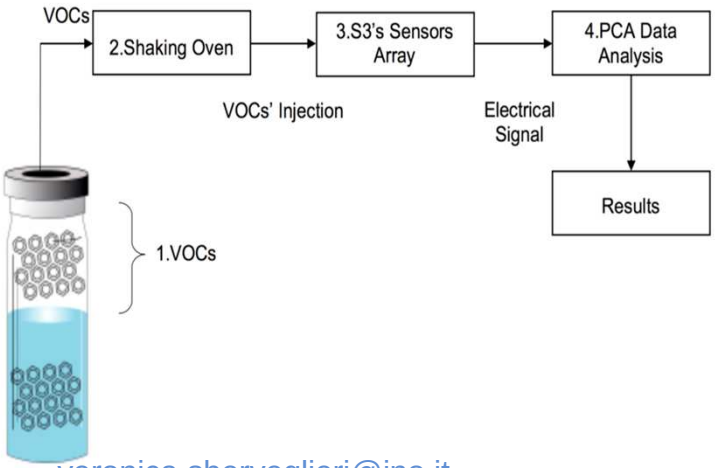
1. Cooperazione
2. Tipo di Sensori
3. Preparazione dei Campioni 4. Addestramento (Data Base)



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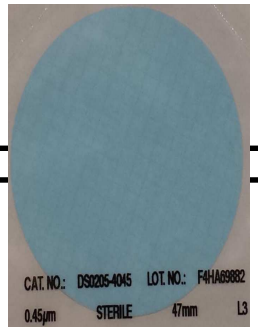
Addestramento



S3

Drinking Water Samples

50 CFU/mL

500 CFU/mL

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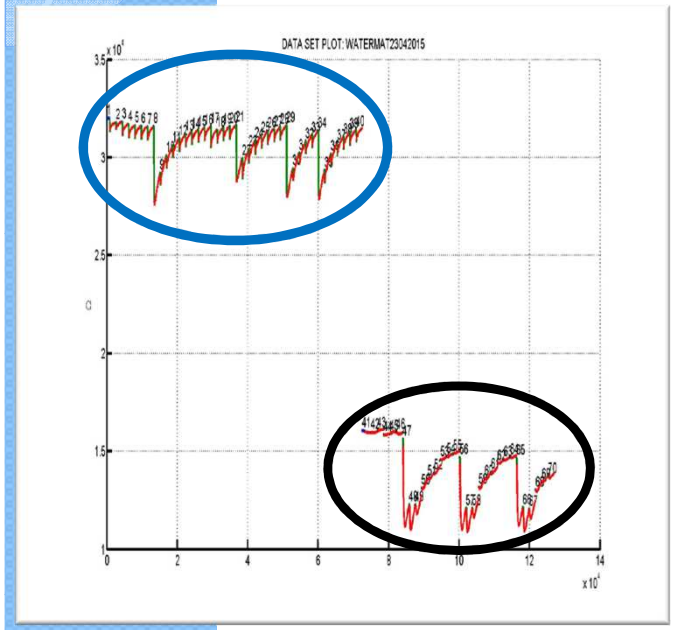
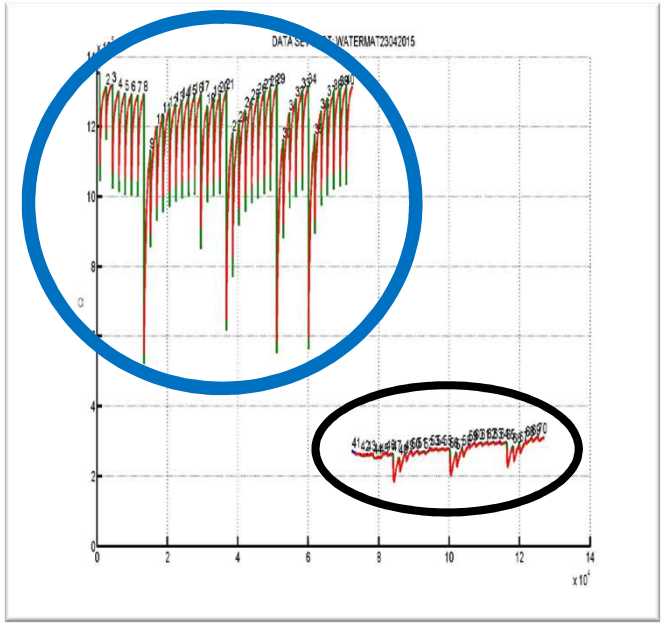
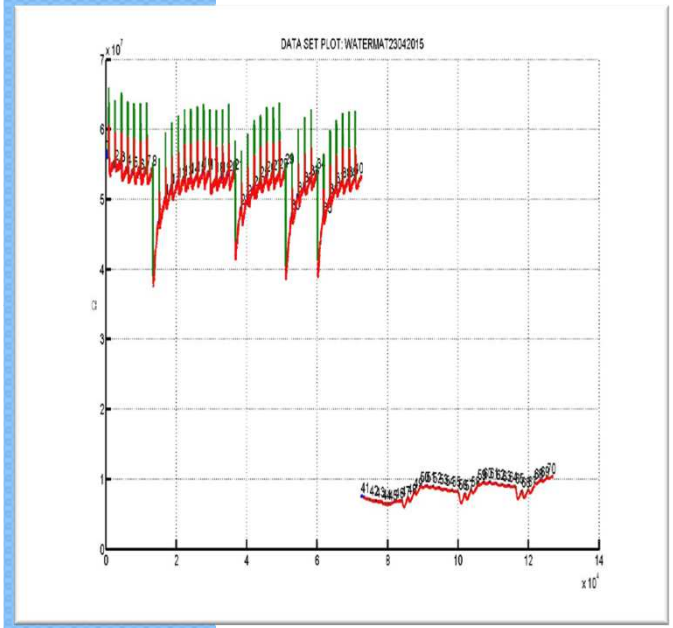
Plot dei Sensori



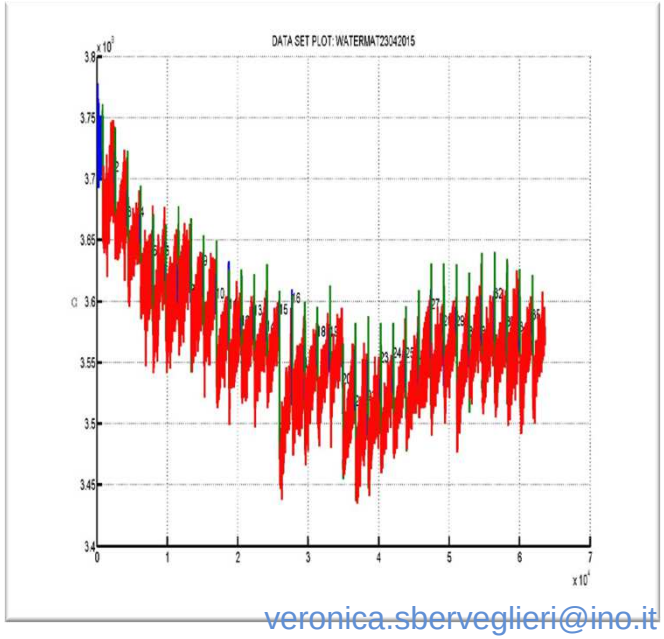
RGTO SnO_2 – MoO_2 “Sensor Plot”



Nanowire SnO_2 “Sensor Plot”



RGTO SnO_2 – WO_3 “Sensor Plot”



Nanowire ZnO “Sensor Plot”

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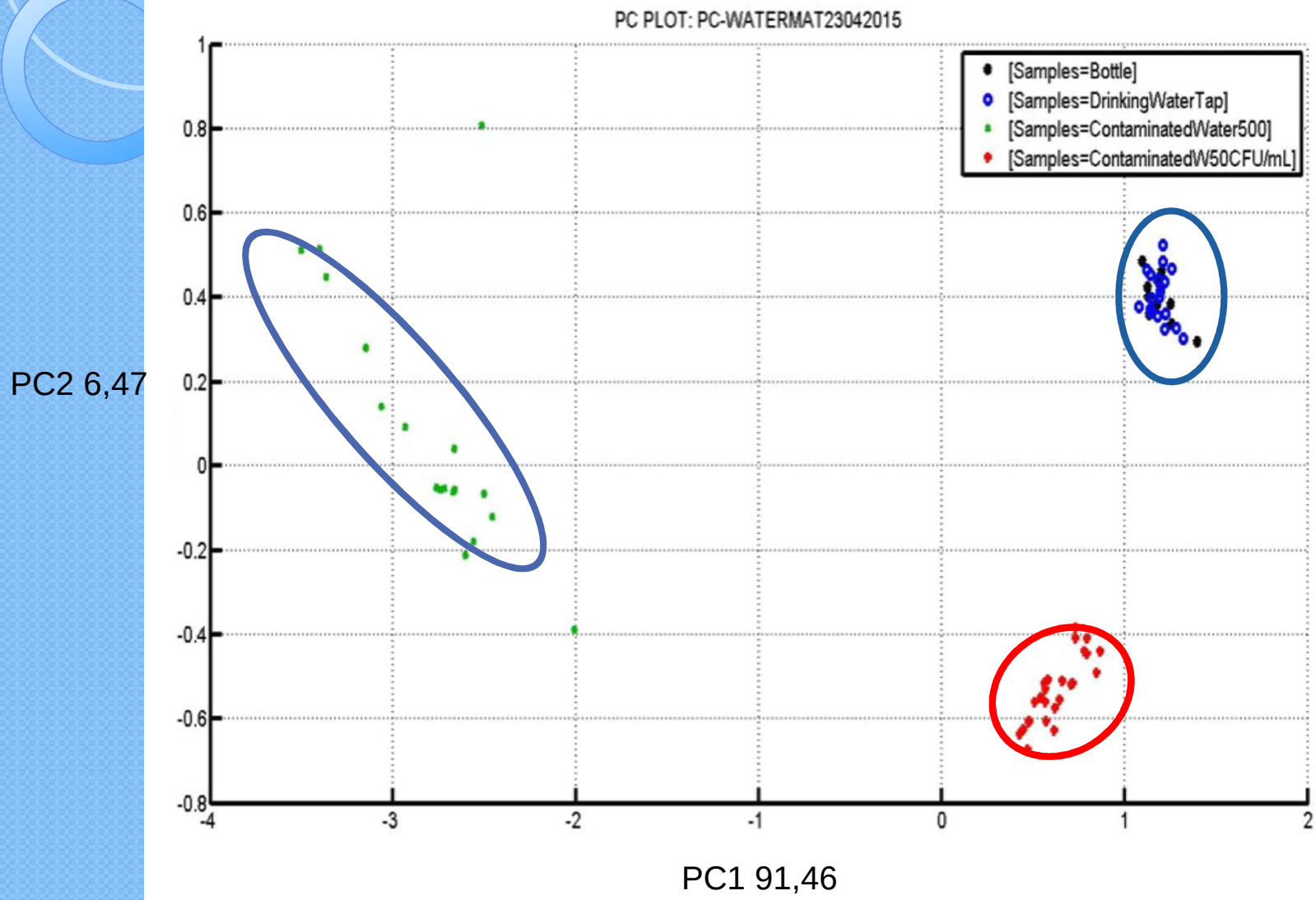
PRINCIPAL COMPONENT ANALYSIS (PCA) RESULTS…



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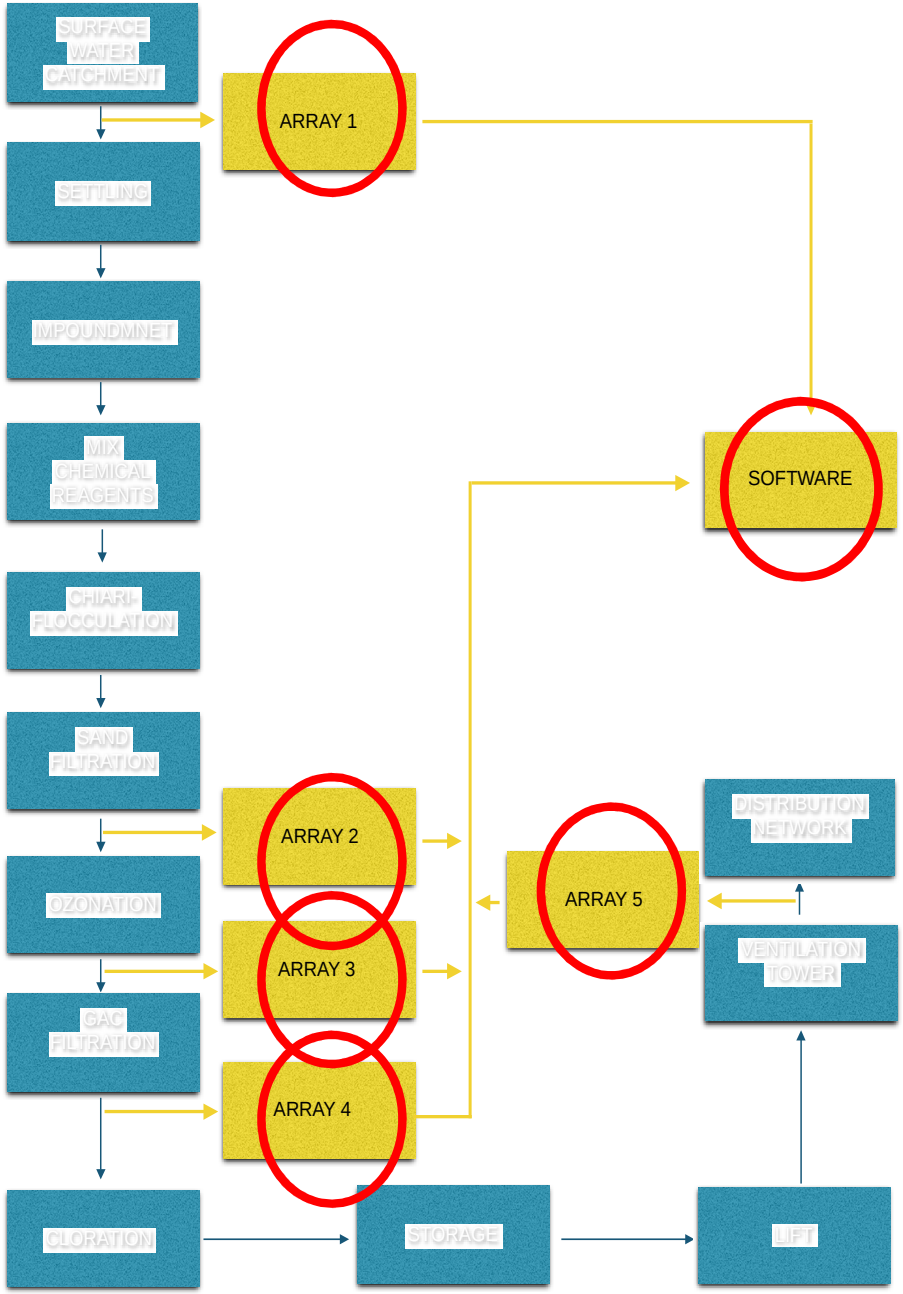
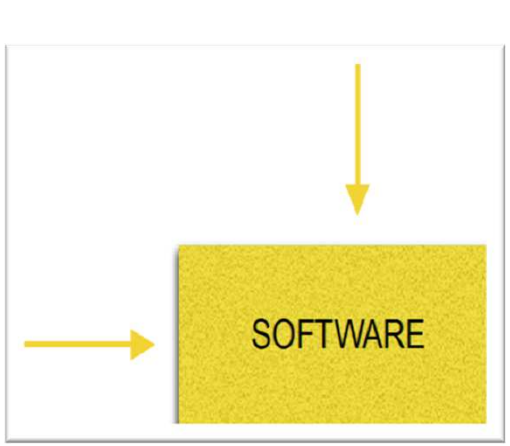
Applicazioni Industriali





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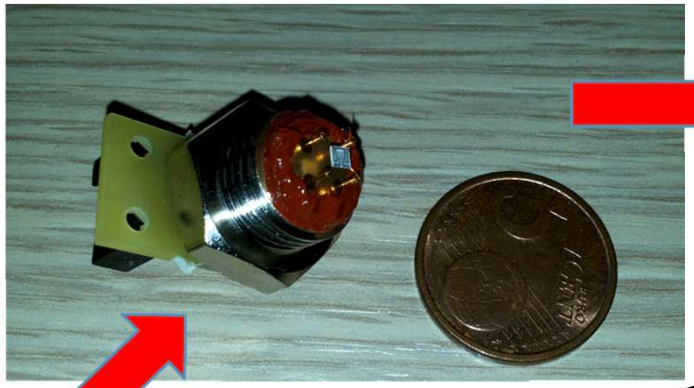
Lavori Futuri



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