waag society

institute for art, science and technology

RIVM #samenmeten van vuurwerk

Een beetje Jurre Ongering en een beetje Waag Society
Presentatie Do-It-Yourself sensing in the City // 21-02-2018
Kattenburgerstraat 5 Commandantswoning

Te bespreken

- Waag Society
- Eigen motivatie
- Assembly
- Code
- Data
- Social media
- RIVM conclusies
- Knallen!

Waag Society

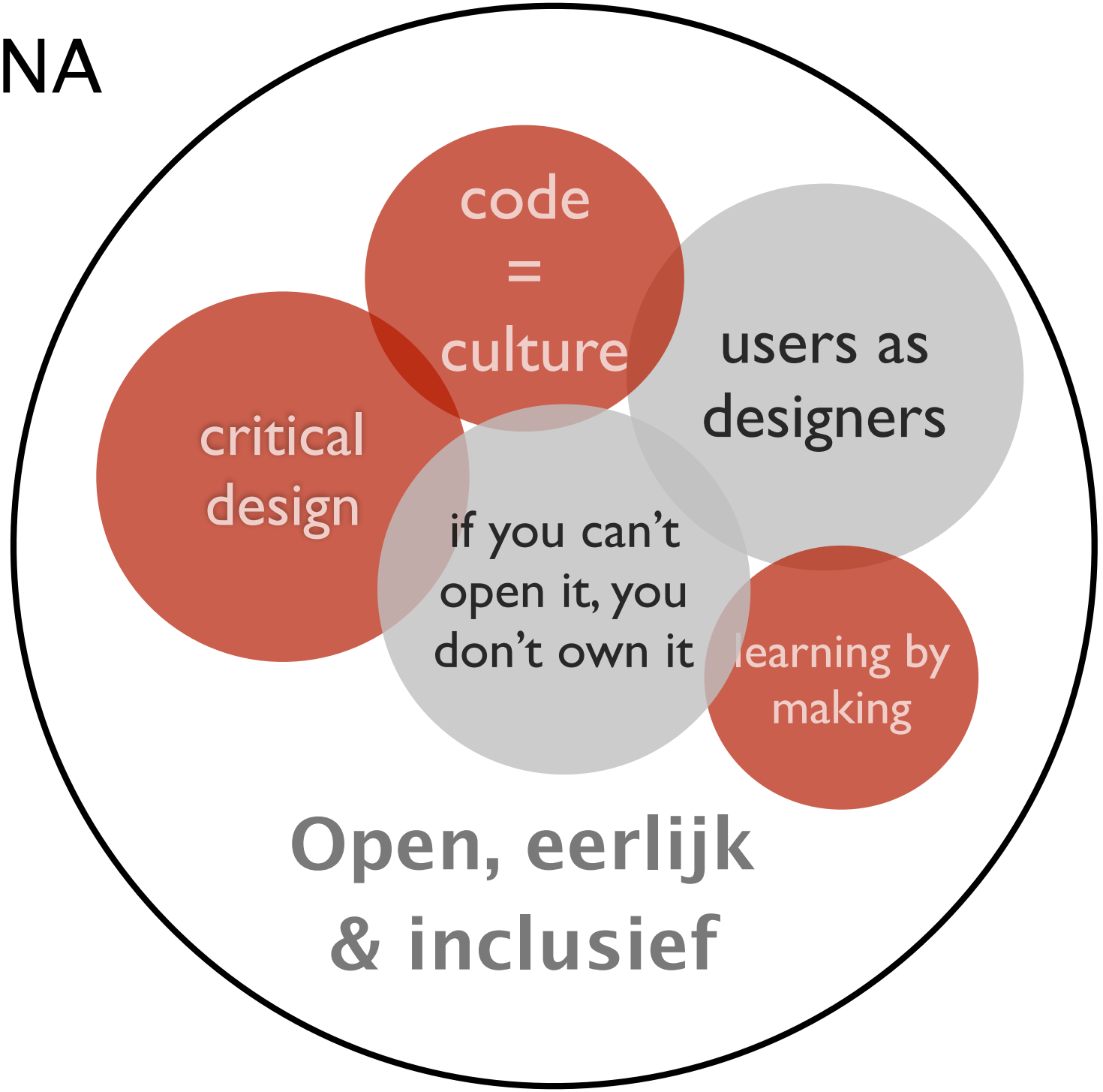
Waag Research labs

Sector

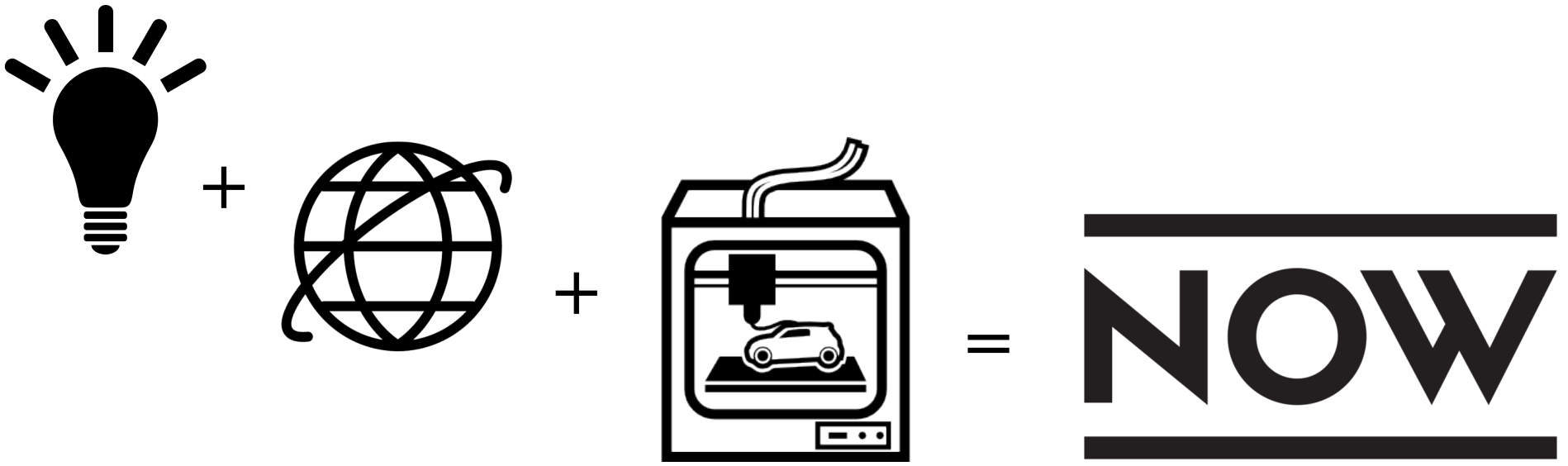
Theme

Place
and Practice

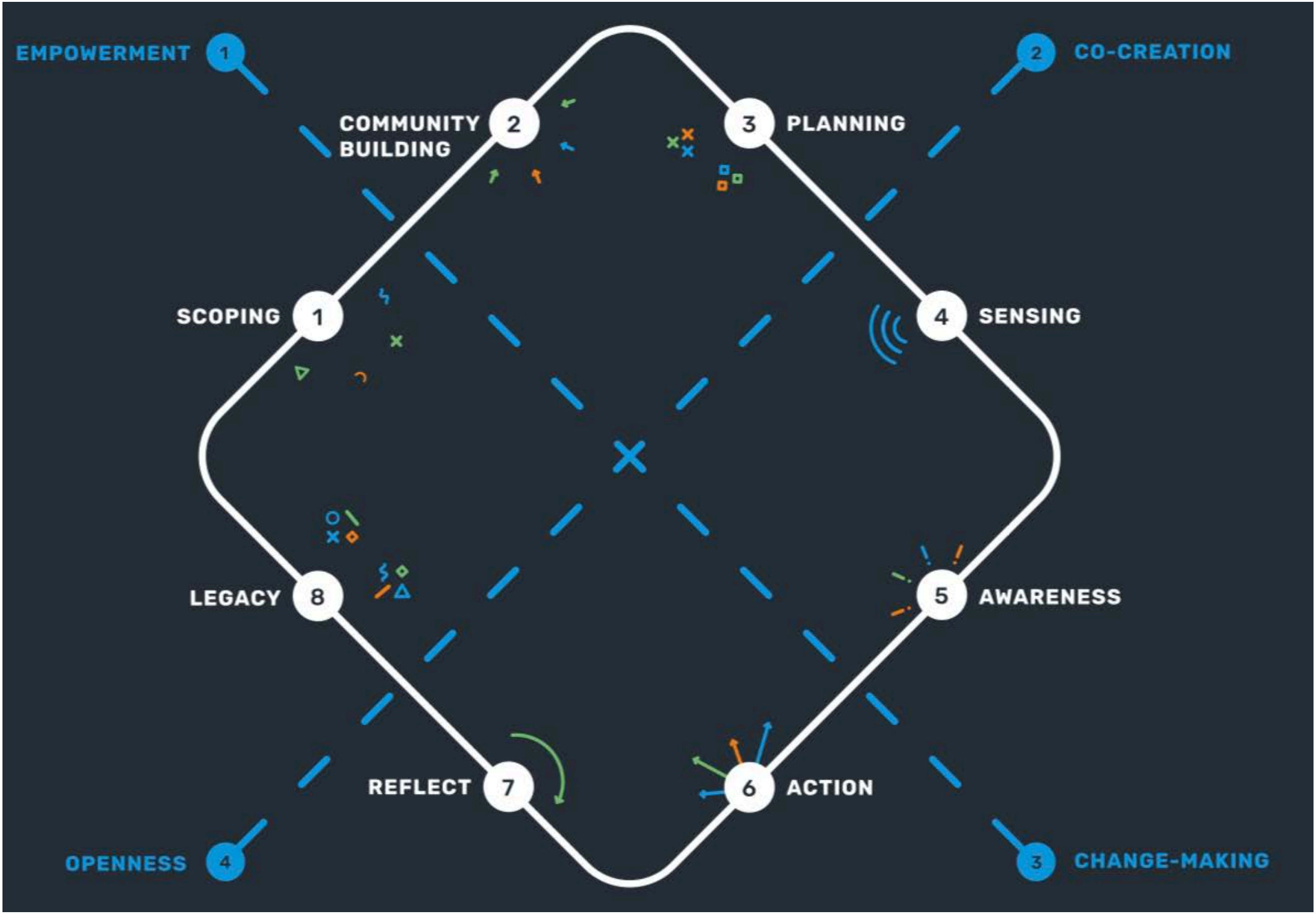
DNA


code
=
culture
critical
design
users as
designers
if you can't
open it, you
don't own it
learning by
making
Open, eerlijk
& inclusief

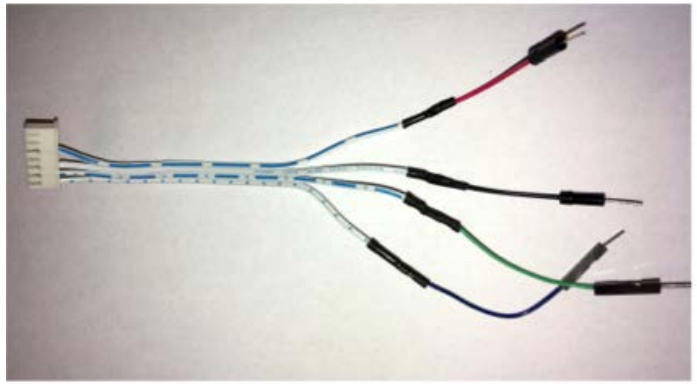
Waarom nu?



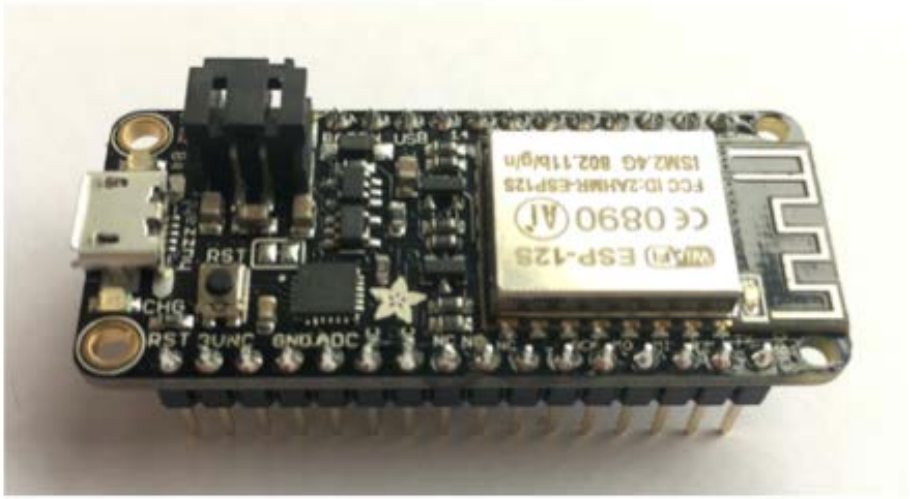
Eigen motivatie


EMPOWERMENT 1
2 CO-CREATION
COMMUNITY BUILDING 2
3 PLANNING
SCOPING 1
4 SENSING
LEGACY 8
5 AWARENESS
REFLECT 7
6 ACTION
OPENNESS 4
3 CHANGE-MAKING

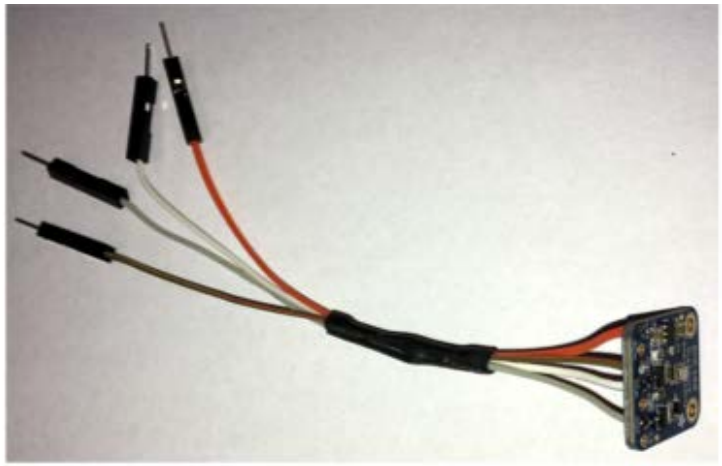
Nova SDS011 stofsensor



Snoer voor SDS



ESP8266 WiFi chip



BME280 T/RH/P sensor met snoer

Aanzuigslang

National Institute for Public Health
and the Environment
Ministry of Health, Welfare and Sport

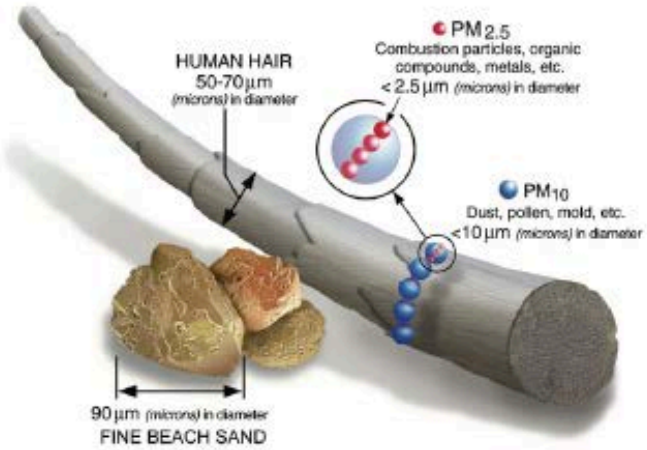
RIVM / Air Quality

National Institute for Public Health and the Environment (RIVM)

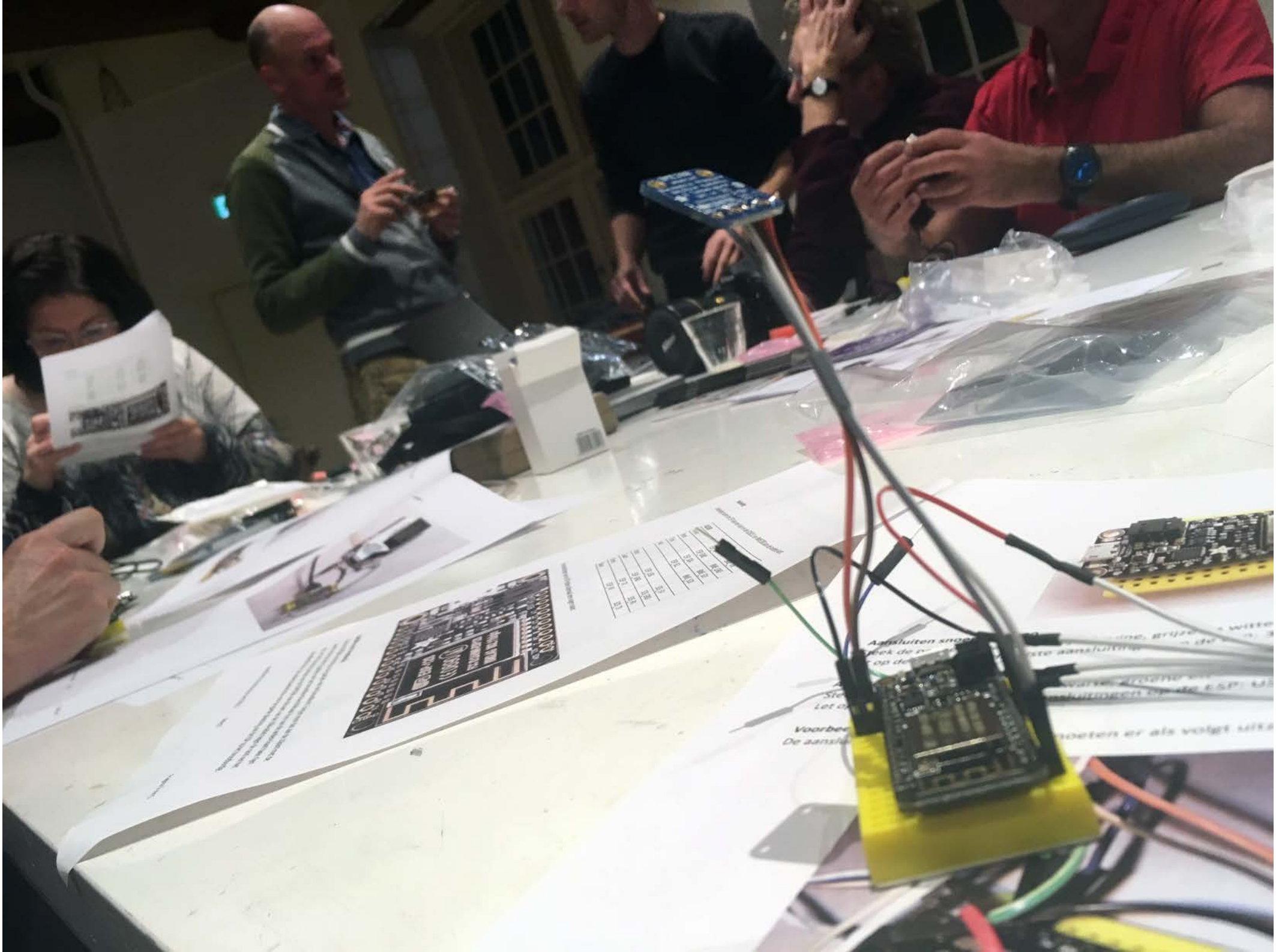
Air Quality

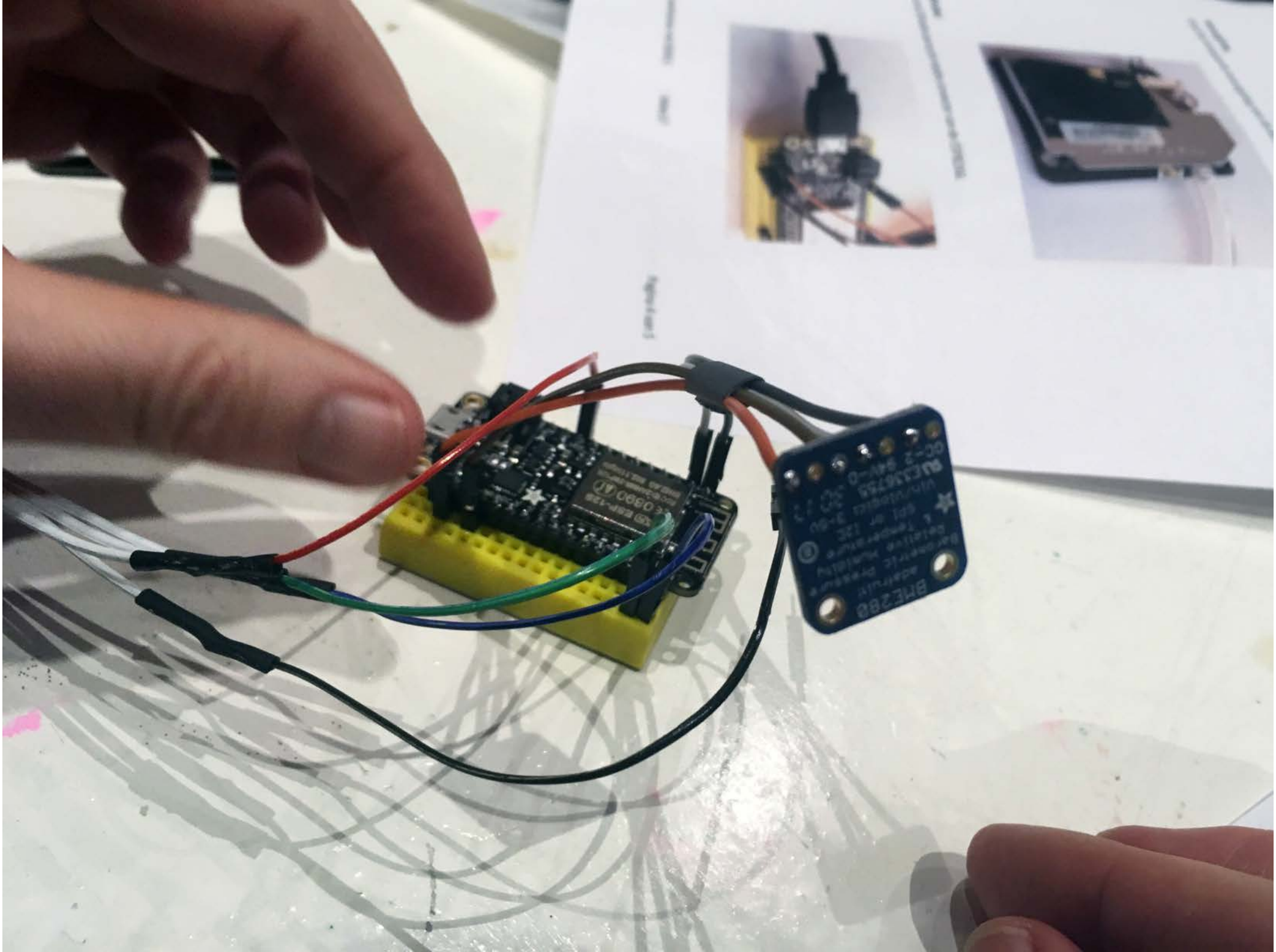
Gaseous pollutants

Particulate Matter (PM10/PM2.5)



"Particulate Matter (PM), …, is a complex mixture of extremely small particles and liquid droplets that get into the air. Once inhaled, these particles can affect the heart and lungs and cause serious health effects." (US EPA, 2017)





BME280 T/RH/P sensor met snoer
(oranje/bruin/grijs/wit)

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Samen Meten, RIVM

SamenMeten

This is the GitHub repository for the National Institute for Public Health and the Environment

Block or report user

National Institute for Public H...

Bilthoven, The Netherlands

http://www.rivm.nl

Overview Repositories 1 Stars 0 Followers 7 Following 0

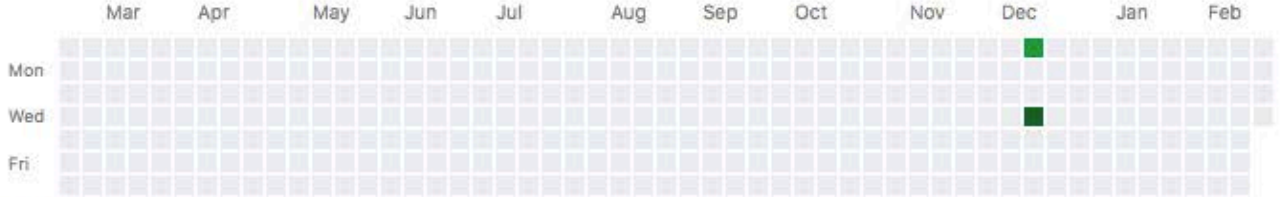
Popular repositories

Air-quality-effects-Fireworks-using-Shinyei

A simple sketch used to measure air-quality effects of fireworks in 2016/17 and 2017/18

Arduino ★ 2

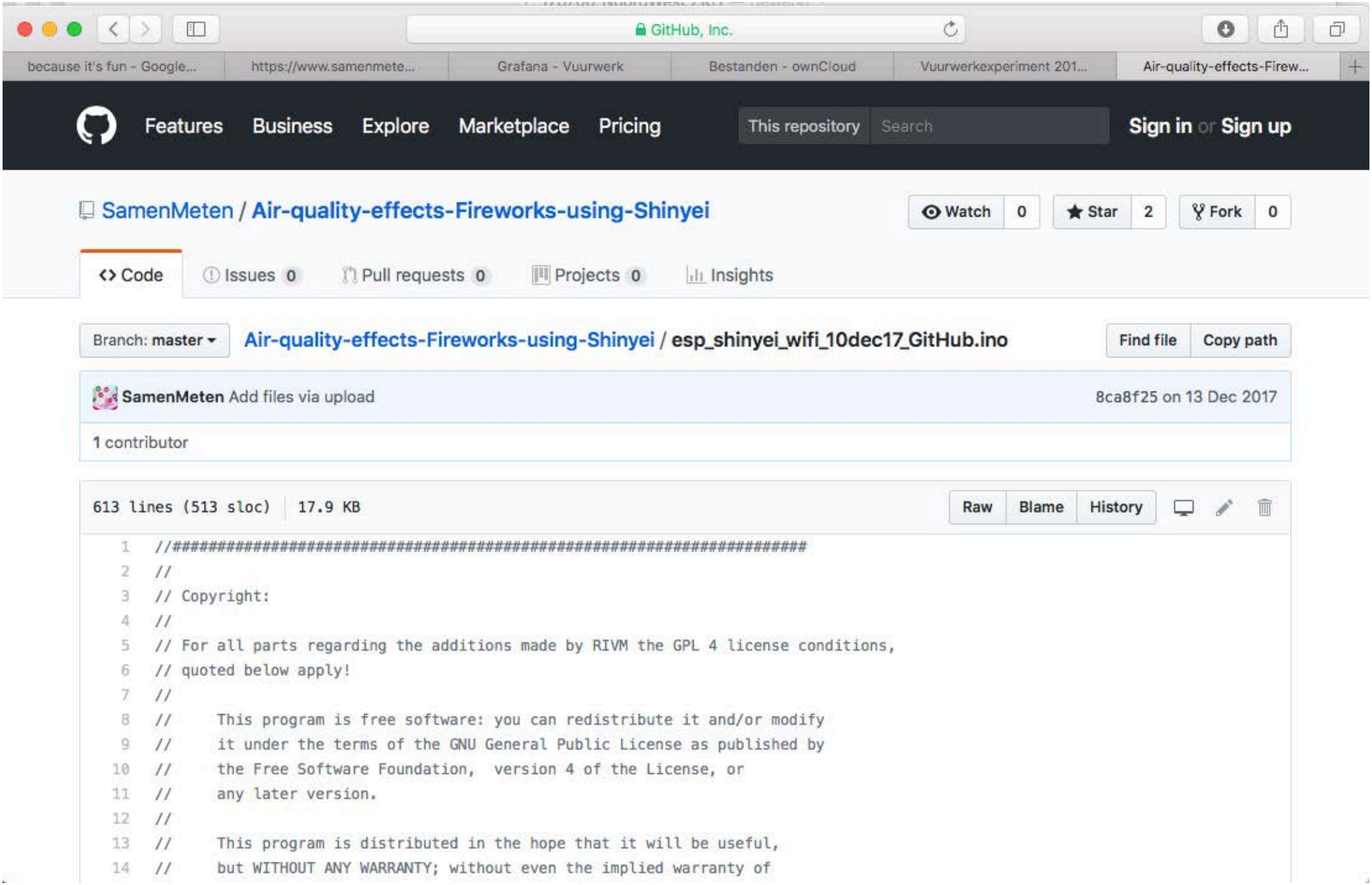
11 contributions in the last year



Contribution activity

Jump to 2018

January - February 2018


GitHub, Inc.
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https://www.samenmete...
Grafana - Vuurwerk
Bestanden - ownCloud
Vuurwerkexperiment 201...
Air-quality-effects-Firew...
Features
Business
Explore
Marketplace
Pricing
This repository
Search
Sign in or Sign up
SamenMeten / Air-quality-effects-Fireworks-using-Shinyei
Watch 0
Star 2
Fork 0
Code
Issues 0
Pull requests 0
Projects 0
Insights
Branch: master
Air-quality-effects-Fireworks-using-Shinyei / esp_shinyei_wifi_10dec17_GitHub.ino
Find file
Copy path
SamenMeten Add files via upload
8ca8f25 on 13 Dec 2017
1 contributor
613 lines (513 sloc)
17.9 KB
Raw
Blame
History
1 //###
2 //
3 // Copyright:
4 //
5 // For all parts regarding the additions made by RIVM the GPL 4 license conditions,
6 // quoted below apply!
7 //
8 //   This program is free software: you can redistribute it and/or modify
9 //   it under the terms of the GNU General Public License as published by
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11 //   any later version.
12 //
13 //   This program is distributed in the hope that it will be useful,
14 //   but WITHOUT ANY WARRANTY; without even the implied warranty of

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because it's fun - Google... | https://www.samenmete... | Grafana - Vuurwerk | Bestanden - ownCloud | Vuurwerkexperiment 201... | Air-quality-effects-Firew...

```
//=============================================
// Code for NodeMCU v1.0 module (ESP8266)
// Waag Society, Making Sense
// author: Dave Gonner & Emma Pareschi
// version 11 May 2016
//=============================================
// RIVM, aanpassingen Joost Wesseling
// Version 25 september 2016
// Version 28 september 2016
// - Aangepast voor test-data.
// Version 24 November 2016
// - Aangepast voor voor metingen aan vuurwerk.
//=============================================


#include <FS.h>                   // Make sure ESP library 2.1.0 or higher is installed
#include <ESP8266WiFi.h>          //https://github.com/esp8266/Arduino
#include <DNSServer.h>
#include <ESP8266WebServer.h>
#include <WiFiManager.h>          //https://github.com/tzapu/WiFiManager
#include <ArduinoJson.h>          //https://github.com/bblanchon/ArduinoJson
#include <PubSubClient.h>         //https://github.com/knolleary/pubsubclient

// DEFAULT MQTT SETTINGS, will be overwritten by values from config.json
// We only use some variables in the interface of the Access Point formed
// by the ESP. For communicating we do NOT use MQTT, but employ the
// services of Dweet.io .

char mqtt_server[41] = "VUURWERK 2016/2017\0";
char mqtt_portStr[7] = "12345\0";
char mqtt_username[21] = "not used\0";
char mqtt_password[21] = "not used\0";
```

Voor de resultaten op de kaart zie: http://samenmeten.rivm.nl/vuurwerk/

De numerieke resultaten van de standaard kits staan op: http://lkvis.rivm.nl/dashboard/db/vuurwerk?orgId=1

Algemene projectpagina RIVM:
https://www.samenmetenaanluchtkwaliteit.nlvuurwerkexperiment-20172018

GitHub RIVM: https://github.com/SamenMeten/Air-quality-effects-Fireworks-using-Shinyei

Beste allen,

Afgelopen zaterdag hebben we vanuit het RIVM op de "Things Conference" in Amsterdam (https://www.thethingsnetwork.org/conference/) een presentatie over het vuurwerk-experiment gegeven. We hebben de opzet gepresenteerd, de gemiddelde resultaten van de sensoren getoond en een vergelijking met officiële metingen. Op de site van The Things Network zullen binnenkort de presentaties beschikbaar komen. Hierbij vast onze presentatie.

Inmiddels zijn we in meer detail aan het onderzoeken hoe de sensoren zich verhouden tot officiële resultaten. Hierbij blijkt vooral een correctie voor relatieve vochtigheid van belang. Bij een relatieve vochtigheid boven 90-95% nemen de afwijkingen van de sensoren sterk toe. Dit veroorzaakt de scherpe en hoge pieken die in de resultaten zichtbaar zijn. Binnenkort meer.

Met vriendelijke groet,
Best regards,

Joost Wesseling

National Institute for Public Health and the Environment; www.rivm.nl
Centre for Environmental Quality (MIL)

Dit bericht kan informatie bevatten die niet voor u is bestemd. Indien u niet de geadresseerde bent of dit bericht abusievelijk aan u is verzonden, wordt u verzocht dat aan de afzender te melden en het bericht te verwijderen. Het RIVM aanvaardt geen aansprakelijkheid voor schade, van welke aard ook, die verband houdt met risico's verbonden aan het elektronisch verzenden van berichten.
www.rivm.nl *De zorg voor morgen* begint vandaag

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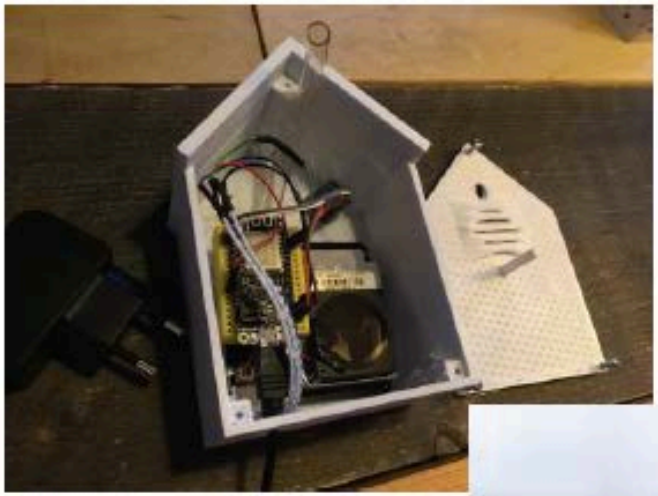
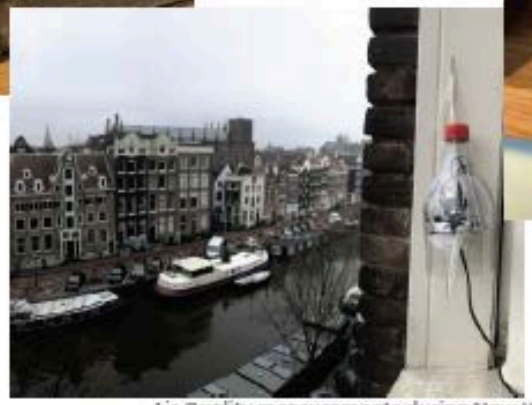
www.rivm.nl/en Committed to *health and sustainability*

DIY Case

National Institute for Public Health and the Environment
Ministry of Health, Welfare and Sport

Housing





"This is not a bomb, but for measuring air quality. Please don't touch."

3815587

Hoe laat heb ik de stekker eruit getrokken?

http://lkvis.rivm.nl/dashboard/db/vuurwerk?orgId=1

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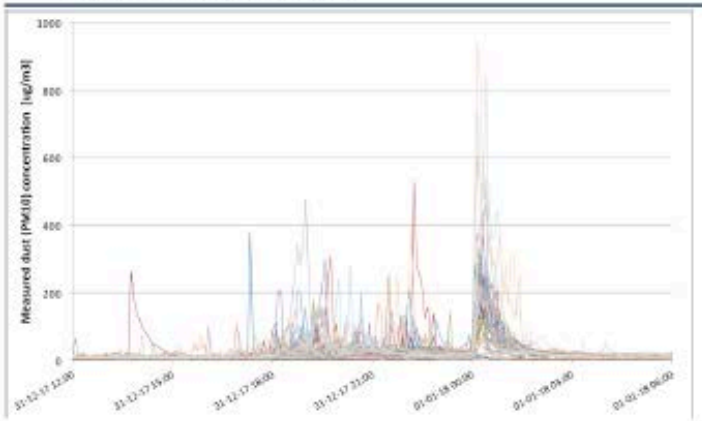
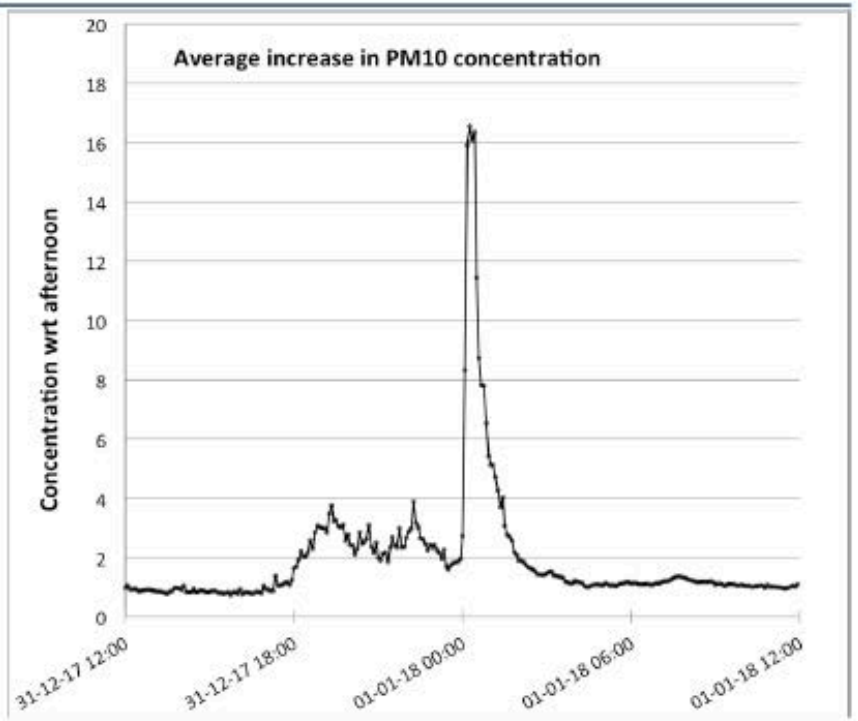
Ministry of Health, Welfare and Sport

PM10 Data



The concentrations were normalized using the values of the afternoon.

On average, the PM10 concentrations increased by a factor of almost 17.



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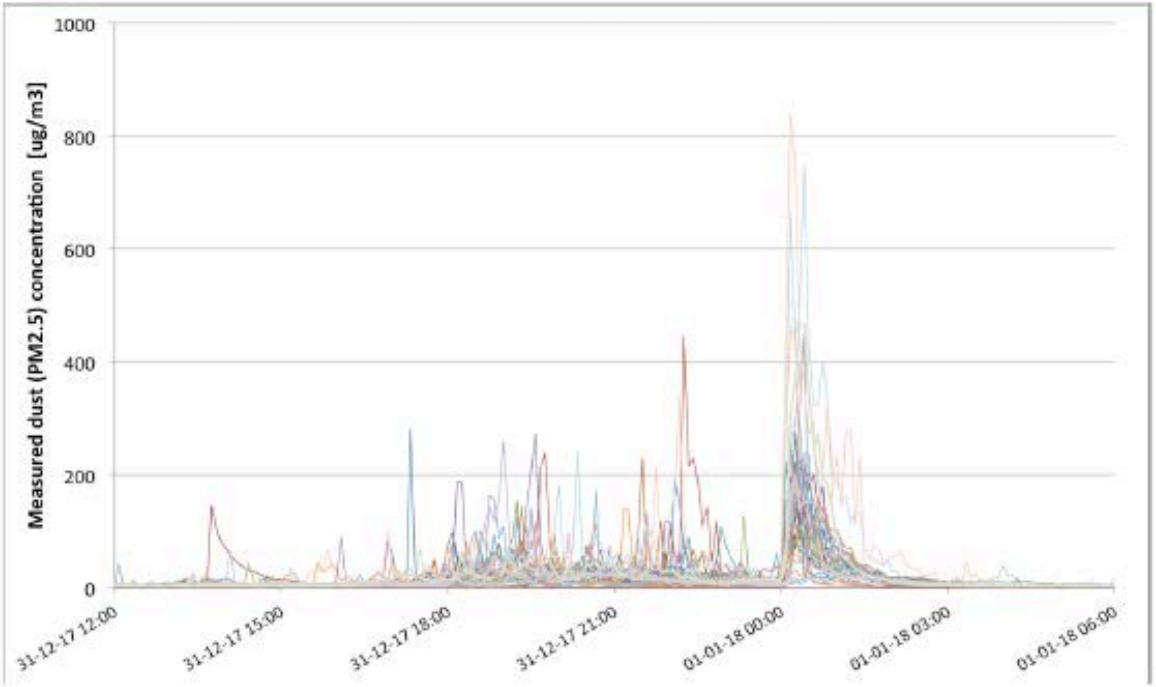
PM2.5 Data



- The concentrations of smaller dust particles (PM2.5) reported by the sensors were also quite high.
- The global pattern is quite similar to that of the larger PM10 particles.

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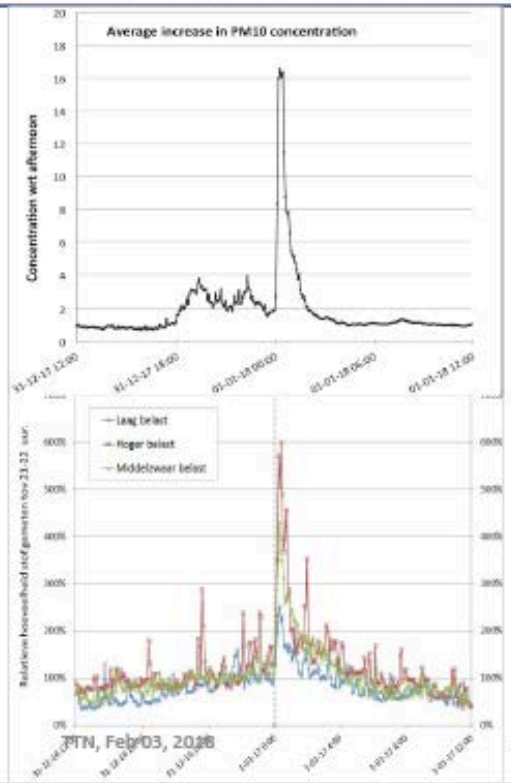
Comparison to 2016/2017



- The average value of the increase in dust concentrations is larger with the Nova SDS011 sensor than with the Shinyei PPD42.
- Last New Year there were higher wind speeds, so concentrations should be lower.
- The normalization of the two data sets is slightly different.
- Probably the Nova SDS011 is more sensitive than the Shinyei PPD42.
- The Nova also shows much more fluctuations in “normal” periods.

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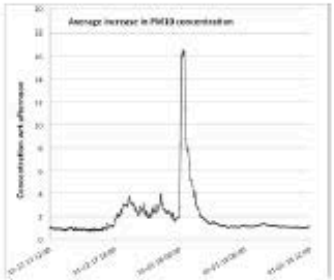
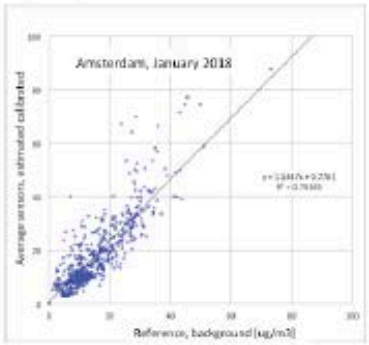
Conclusions





- During New Year's evening of 2016/2017, dust concentrations were successfully monitored using cheap and simple sensors (Nova SDS011).
- Data from different organisations/groups of people were combined.
- For the first time LoRa was used by RIVM, tastes for more
- Test sensors during several months in 2018, compare to official data. First results are promising.

GIRL STABBED
WITH STILETTO
IN FOG
FOURTH NIGHT OF FOG
CHAOS IN LONDON

Jurre Ongering
@Jurreongering

Ha @rivm en @samenmeten, Wat verklaart dat ik bij Amsterdamse mist van de laatste dagen hogere fijnstofconcentratie meet dan toen er hier een 100.000 klapper werd afgestoken? #durftemeten

Translate from Dutch

12:57 PM - 13 Jan 2018

7 Retweets **11** Likes

3 7 11

Samen milieu meten @samenmeten · Jan 13

Replying to @Jurreongering @rivm

Kan zeker met beïnvloeding van de meetwaarden door vocht te maken hebben. We gaan dit jaar kijken of we hier in kalibratie van de sensoren rekening mee kunnen houden.

Translate from Dutch

1 4

Sering 80 @sering80 · Jan 13

Replying to @Jurreongering @rivm @samenmeten

Houtstokers in de buurt?

Translate from Dutch

2

Patrik Winiger @PatrikWiniger · Jan 13

For example a hygroscopic tandem differential mobility analyzer (H-TDMA). It basically dries particles, measures dry diameter and then re-humidifies particles at ~90% rel. humidity and measures particle size and number again.

1 1

Dieter Pientka @Cumulus1966 · Jan 13

Wow, you are very keen on this topic! I have two Dylos sensors, I guess this is also a nephelometer type, because the detector is in line with the laser beam. There is an 90° angle of the detector to the beam @Scapeler

1 1

Patrik Winiger @PatrikWiniger · Jan 13

Dylos seems like a professional product (good quality/price). Could not find specs, but maybe they correct for some humidity with internal calculation? I use this, cheaper & less reliable, sensor (luftdaten.info/nl/startpagina/) just for fun, on my balcony in Amsterdam.

2 1

Dieter Pientka @Cumulus1966 · Jan 13

Very interesting! Could it also be the case, at high RH%, the laser is sensitive for the moisture particles as such? The higher RH%, the bigger the moisture particles can grow and hence bigger diameter.

1

Patrik Winiger @PatrikWiniger · Jan 13

That is correct. The SDS011 measure principle (Nephelometer) is sensitive to larger, scattering particles such as fog (typical fog size is about 10 micrometers; PM10).

2 1

Patrik Winiger @PatrikWiniger · Jan 13

A minor effect could be small particles (smaller than PM0.3) that grow bigger under high humidity and could then be detected by the nephelometer. However, better (and much more expensive) instrument would be needed to confirm this.

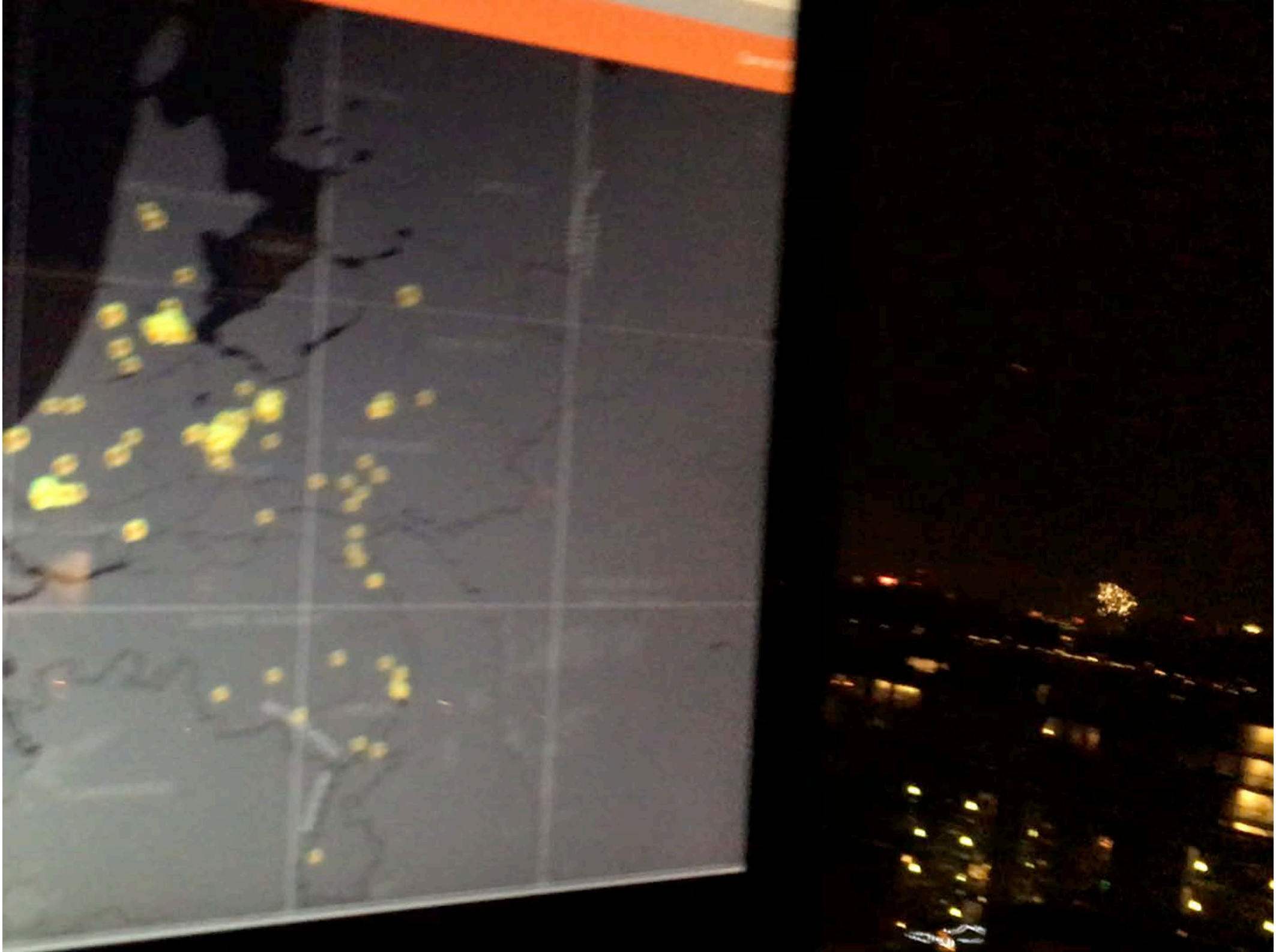
1 1

Patrik Winiger @PatrikWiniger · Jan 13

Replying to @Jurreongering @rivm @samenmeten

Depends on sensor and measured property (PM2.5?). The Nova Fitness SDS011 for example only properly works up to ~70% relative humidity and shows higher values above that. Generally, higher humidity means less particles due to clustering and bigger particles deposit faster.

1 1 2



Meet the pro's?

Citizens Sensing, a toolkit

08 maart 2018, 19.30 u. tot 22.00 u.

http://waag.org/nl/event/smart-citizens-lab-citizen-science-crash-course

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institute for art, science and technology

jurre@waag.org // Creative Care Lab // Waag Society // 21-02-2018