IEEE SA STANDARDS ASSOCIATION

IEEE P2520.3.1 Working Group
September-Meeting Minutes
13 September 2021 / 11:00 AM – 12:00 PM (ET)
WG Vice Chair: Dr. M. Sabarimalai Manikandan (Acting)
WG Secretary: Dr. Srikanth Kavirayani
Teleconference Meeting
link:https://ieeesa.webex.com/ieeesa/j.php?MTID=m19a2593d4c145fbe79cbbc7dd8041473

1. **Call to Order**
   In absence of the Chair, the vice chair called the meeting to order at 11:00 AM ET. He reviewed the ground rules for the meeting and announced that the meeting is being recorded for the purpose of preparing minutes and he announced that the chair is unable to attend and has requested the vice chair to conduct the meeting.

2. **Revised roll Call and revised registration process**
   Affiliation FAQs: http://standards.ieee.org/faqs/affiliation.html
   The Chair directed participants to register vide the link through an excel in the Chat window. All participants were asked to mark a 'V' in the row with their names, email, affiliation, and WG membership request against the meeting date. A few minutes were allowed for participants to access and complete the registration process. New registrations were asked to be appended at the bottom of the list.

3. **Establishment of Working Group Membership**
   The Chair disclosed the attendance form and welcomed all the new Working Group (WG) members. The list of participants may be found in **Attachment A**.

4. **Approval of Agenda**
   The Chair displayed the announced agenda, however due to the lack of quorum, the meeting was continued without approving the agenda.

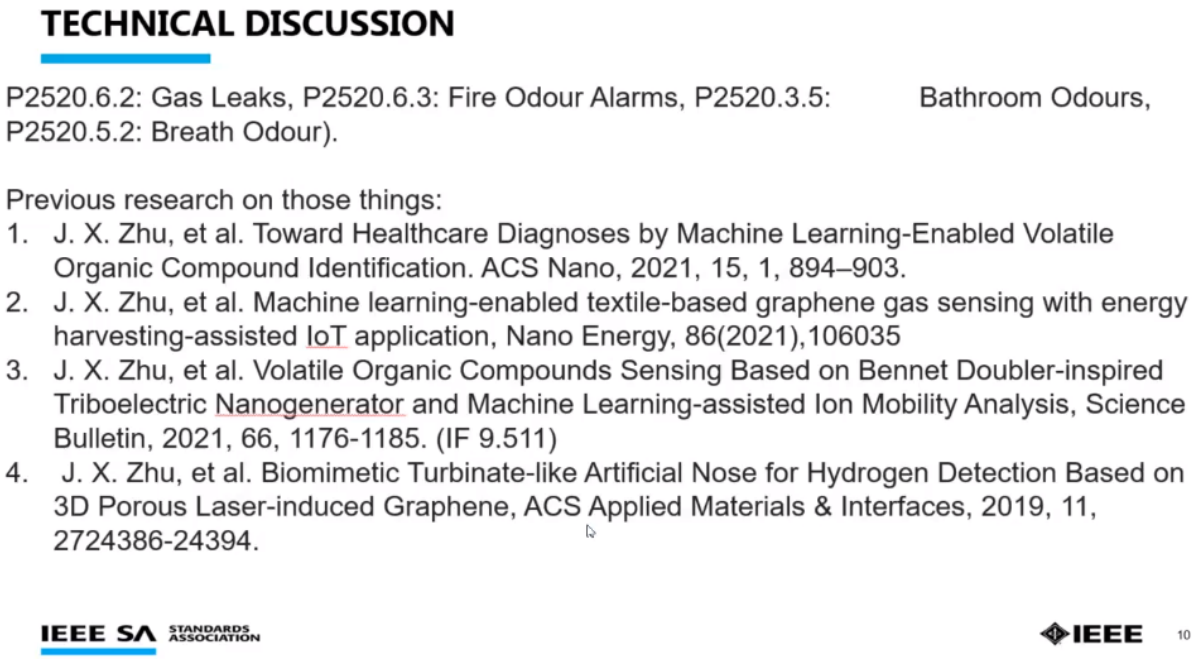
5. **Review of Working Group Policies & Procedures (P&Ps)**

   The Vice Chair referred the WG to the proposed P&P Manual that was distributed earlier to the group. He then reviewed the following sections of the WG's P&P Manual in some detail.
   a. IEEE SA patent policy was elaborated.
   b. The clauses under letter of assurance (LOA) were elaborated.
   c. The approval of previous meeting minutes was called for by the vice-chair and the secretary noted there were only 6 voted out of the 7 required for the quorum. After a wait of 5 minutes, there were only 6 people who responded.

d. Members suggested to wait for the next meeting to approve the meeting minutes.

6. Discussion# Baseline Performance

1. Baseline performance discussions as part of technical discussion were initiated by the vice chair and a call for discussion to Zhu was made and the publications by Mr. Zhu were discussed.



TECHNICAL DISCUSSION

P2520.6.2: Gas Leaks, P2520.6.3: Fire Odour Alarms, P2520.3.5: Bathroom Odours, P2520.5.2: Breath Odour).

Previous research on those things:

1. J. X. Zhu, et al. Toward Healthcare Diagnoses by Machine Learning-Enabled Volatile Organic Compound Identification. ACS Nano, 2021, 15, 1, 894–903.
2. J. X. Zhu, et al. Machine learning-enabled textile-based graphene gas sensing with energy harvesting-assisted IoT application, Nano Energy, 86(2021),106035
3. J. X. Zhu, et al. Volatile Organic Compounds Sensing Based on Bennet Doubler-inspired Triboelectric Nanogenerator and Machine Learning-assisted Ion Mobility Analysis, Science Bulletin, 2021, 66, 1176-1185. (IF 9.511)
4. J. X. Zhu, et al. Biomimetic Turbinate-like Artificial Nose for Hydrogen Detection Based on 3D Porous Laser-induced Graphene, ACS Applied Materials & Interfaces, 2019, 11, 2724386-24394.

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2. Zhu elaborated on how his publications (latest) will be useful for this standard. Zhu elaborated on 4 different papers, the first one on cancer diagnoses, the gas leak of hydrogen, the third manuscript discussed the outdoor odor and the fourth on artificial nose.

3. Questions were raised by Dr. Manikantan and were answered by Zhu on the types of gases and how gas leaks for hydrogen detection were done.
4. The question on the functionality for Artificial nose for other gases other than hydrogen detection, Zhu indicated it will sense only 1 gas. He elaborated that the response to some other gas would be no response to other gases other than hydrogen. The material used will detect only hydrogen.
5. What is the detection range was asked by Sagar and was responded as 2%
6. A question on if there was a comparison between machine learning algorithms or if they used an optimal algorithm was posed by Sagar?

7. Can you please elaborate on process Identification followed in paper 1 was posed by Dr. Srikanth.
Zhu answered that mixture of gases was exposed to the machine, the number for each gas would be different. For instance, 2800 for one gas and 1600 for another gas. The combination of curves was used by the company for detecting the different gases.

8. Did you follow any European standard for designing the artificial nose for sensitivity and range.
Zhu responded that it was mentioned that the range is 200 ppm

9. Dr. Manikandan started his presentation on a few more discussions on highly impacting gases that effect the health care. He has a project on climate change on human health. He elaborated on what are the different types of diseases and what was the impact on health air quality related diseases were elaborated. The pollutants and the type of disease were discussed. He elaborated on primary pollutants and secondary pollutants and the focus is on indoor pollutants, the gas that detect coming from different sources. The indoor air quality index was elaborated as good or otherwise helpful for identifying diseases. Ammonia detection, fusion algorithms to identify non-communicable diseases based on weather conditions or based on location as well were discussed. Similarly drinking water quality which causes communicable diseases like typhoid, cholera, and the water smell would be different. If animal waste mixes, the water smell changes. So, the standards have to predict these types of changes. Variation in pH values once deployed in water body it can sense the water quality and smell and it can detect the disease as well. Unsafe water is a leading risk factor for death and unsafe water is responsible for 1.2million deaths each year. So, the development of a device would reduce the same.
He proposed a project on health monitoring system for air quality/water quality and different types of diseases

10. Prof. Nagle raised a question if they are odor sensors or chemical sensors?
How is it related to the standard that we are trying to develop?
Mr. Manikandan elaborated on the answer and also discussed on how Industrial mix or sewage waste mixing with water, the water smell changes and with increased temperature the effect is higher.

11. Prof. Nagle suggested a brainstorm session to link the different cases in specific cases for 2520.3.1 for indoor odors to general conditions.

7. Next Meeting

The vice chair announced that the next meeting of the P2520.3.1 WG will take place on October 11 at 11 AM ET.

8. **Adjourn**
   The Agenda having been completed, with a decision to approve the previous meeting and this meeting minutes in the next meeting, the WG Vice Chair adjourned the meeting at 12:05 AM.

***Post meeting Note by the Chair: based on Webex recording, there were 7 people present in the meeting whom their names are listed in Attachment A. Please contact e.danesh@ieee.org if your name is entered in the list incorrectly.

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Attachment A: September Meeting Participants

Last Name	First Name	Affiliation	Country
Member			
Burham	Cynthia	University of Texas at Austin	USA
Kavirayani	Srikanth	Gayatri Vidya Parishad College of Engg(Autonomous), Visakhapatnam	India
Manikandan	M.Sabarimalai	Indian Institute of Technology, Bhubaneswar	India
Nagle	Troy	ECE & BME, NC State University	USA
SAGAR	A S M SHARIFUZZAMAN	Sejong University, Seoul, South Korea	South Korea
Isz	Sandrine	Alpha MOS	France
Non-Member			
Zhu	Jianxiong	Southeast University (of China)	PRC
Staff			

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Attachment B: IEEE P2520 Numbering Scheme (Version 05Aug2020)

***Currently approved PARs are highlighted in yellow**

P2520: **Testing Machine Olfaction Devices & Systems [Susan Schiffman]**
Overview of standard series and definition of what devices/systems are covered

P2520.1: **Baseline Performance [James Covington]**
- Humidity and temperature impacts on single-gas detection
- Concentration curves, response and recovery times, and ternary chemical mixtures
- Sensor system recovery from high concentration exposure
- Odour measurement repeatability in the presence of pairs interfering chemicals

P2520.2: **Outdoor Odour Nuisances and Pollutants**
P2520.2.1: General Outdoor Air Quality [Ehsan Danesh]
P2520.2.2: Landfill odour [Susan Schiffman]
P2520.2.3: Residential Water Supply
P2520.2.4: Sewage Treatment (outdoor and downwind)
P2520.2.5: Animal Confinement (outdoor and downwind)
P2520.2.6: Travel-Based Air Pollution (automotive/rail/planes)
P2520.2.7: Workplace Satisfaction

P2520.3 **Indoor Odour Nuisances and Pollutants**
P2520.3.1: General Indoor Air Quality [Ehsan Danesh]
P2520.3.2: Refrigerator Food Spoilage
P2520.3.3: Cooking/Oven Odours Monitoring
P2520.3.4: Kitchen Odours
P2520.3.5: Bathroom Odours
P2520.3.6: Basement Mould
P2520.3.7: Workplace Satisfaction

P2520.4: **Industrial Application Processes and Quality Control**
P2520.4.1: Chemical Manufacturing [Susana Palma]
P2520.4.2 Petroleum Refinement
P2520.4.3 Paper Mills
P2520.4.4: Animal Rendering
P2520.4.5: Perfumery

P2520.5: **Personal Health and Hygiene**
P2520.5.1: Body Odour
P2520.5.2: Breath Odour
P2520.5.3: Foot Odour
P2520.5.4: Hair Odour

P2520.6: **Safety Protection**
P2520.6.1: Electrical Short-Circuit Odour

P2520.6.2: Gas Leaks (gasoline, pipelines, natural gas)
P2520.6.3: Fire Odour Alarms
P2520.6.4: Animal Confinement Structures (animal and operator safety)

P2520.7: **Medical Applications**
P2520.7.1: Cancer Detection
P2520.7.2: Sensory Impairment Quantification
P2520.7.3: Hospital Patient Room Air Quality
P2520.7.4: Pharmaceutical Quality
P2520.7.5: Allergy Alerts