

## Summary of meeting prepared for Garen Stagline

The meeting was originally organized for [Garen Stagline](#) visit to our medical center, even though the visit was canceled and delayed to next year we have decided to go on and have the meeting and have it take place anyway as we felt it was necessary for the organization of our research at Shaa'r-Menashe MHC under one organizing roof which we call "[Psych-Tech NeuroAnalysis](#)"

As will be evident from the short summary the research orientation of Psych-Tech is focused on finding the etiology of mental disorders and their cure targets at the level of the brain-system, i.e., assuming that mental disorders arise from complex disturbances to whole brain organizations "[Brain Globalopathies](#)" For the discovery of underlying brain disturbances in mental disorders, three types of research efforts must be combined, 1) extracting objective phenomenology, 2) brain signal processing synchronized with the phenomenology, and 3) large-data-mining to discover the causal correlations between brain-disturbances and clinical phenomenology, in simple words what causes the suffering of our patients.

Thus the persons attending the meeting and collaborators who could not make it were typically from two types of research, sensor-computer-technologists extracting clinical phenomenology and brain imaging signal-processing experts. One investor interested in these emerging technologies was present. But others are also interested and will receive this summary.

[Taila Tron](#) was first to speak describing her PhD work supervised by [Prof' Wienshall](#) from the computer-science at the Hebrew University. She studied the "Affect" of schizophrenia patients compared to controls and developed objective computerized accurate tools to extract psychopathological Affect phenomenology, her work is directly relevant for detecting Affect incongruence in schizophrenia patients but relevant also to all other diagnosis relating to Affect e.g., depression.

[Jodie Feil](#) post-doc at [Elisha Moses lab](#) working also with [Nava Levit-Binnun](#) at IDC Herzelia talked about two studies of electrophysiological brain-imaging of patients schizophrenia and controls under destabilizing stimulations designed to perturb the brain and study it's balance equilibrium capabilities. In one of these studies we used TMS (transcranial magnetic stimulation) to perturb the brain and in the other we used a cognitive demand to do that. The analysis of the brains in these studies apply both simple older signal-processing such as Evoked-Potentials but more interestingly also advanced network-analysis using correlation matrices and graph-analysis mathematics.

[Ziv Yekutiely](#) from [Mon4t](#) gave a short overview of the sensors wearable mobile field recently developing in both neurology and psychiatry, emphasizing technology advantages and limitations. Having both academic and commercial backgrounds Ziv's talk represented the commercial and academic strategies that such research and development should have.

Some of our collaborators who could not make it had their work shortly mentioned by myself, [LifeGraph](#) has clinicians from our center working with them, they are extracting clinical phenomenology relevant to patients monitoring using an App' that tracks activity from mobile phones of out-patients.

The "[Computational-Psychiatry lab](#)" headed by [Oren Shriki](#) is planning to research schizophrenia using EEG dry-electrodes wireless device that enable more naturalistic ongoing brain-imaging investigations. As for signal-analysis Avalanche detection for information processing of cognition in patients will be used. This may shed light on possible disturbances to fast-plasticity in patient's brains. Oren also works

in the field of Brain-Simulations and models that can help predict actual signal-processing results and further inform about predicted testable psychopathological mechanisms.

Such neuronal-network modeling work was done in the past with [Amir Geva](#) currently co-founder of “[Elminda](#)” with potential collaboration using their [BNA](#) (Brain Network Analysis).

In EEG brain-Imaging I also work with Noa Fogelson from [Coruna University](#) Spain and our EEG data collected in her study is analyzed in collaboration with [Karl Friston](#) UCL London using [DCM](#) (Dynamic Causal Modeling).

Potential future collaborators also mentioned in the meeting [Tamar Blumenfeld-Katzir](#) explained about fMRI technologies of her [ImagingQ](#). Another potential collaborator that was mentioned in the meeting is [Anat Grinfeld](#) working in the field of brain imaging and experienced also in neural networks and learning algorithms.

Also from the “sensing” side [Ran Geva](#) talked about a planned research of detecting movements of patients using video-detection useful also for side effects of antipsychotic medications

Interest in therapy interventions keeps in the loop potential collaborations with leaders in DBS (Deep Brain Stimulations) i.e., [Alon Sinai](#) from Rambam and Optogenesis [Ofer Yizhar](#) Lab from Weizmann institute. Once initial insights about therapeutic intervention are available they can form the basis of research towards interventions.

As evident from this partial description of the team assembled to collaborate at Shaa’r-Menashe, both phenomenology-extraction and brain-imaging analysis are studied towards the next step of synchronizing brain-phenomenology sensing on the way to the discovery of the causes of mental disorders.

Thank you all participants.