Multi-modal Neurodiagnostic Tool

Linea Research Corporation

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OBJECTIVES

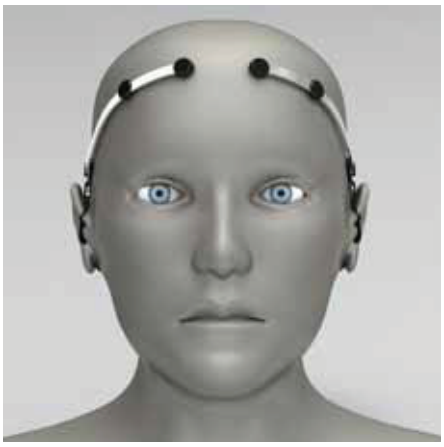
1: Miniaturized multimodal sensor module

2: Wearable device

3: Neurobehavioral parameter generation

4: Verification of system through experiments

5: Automated assessment of behavioral state



ACCOMPLISHMENTS

NOTABLE DELIVERABLES PROVIDED

Development of miniaturized high-gain, low-noise dry-EEG technology

Development of miniaturized high-efficient fNIRS technology.

Development of a novel collocated fNIRS-EEG sensor with capability to provide high-temporal resolution (EEG) and high-spatial resolution (fNIRS) sensor technology.

Modulation schemes for multiple (high-density) sensor probes

Validated fNIRS and dry-EEG sensor technology for stress monitoring and further cross-validated with additional heart-rate-variability and galvanic-skin-response sensor modalities via concurrent experimental verification demonstration.

KEY MILESTONES MET

Highly-miniaturized fNIRS and EEG sensors

Designed and built portable stress monitor with lightweight headgear featuring a collocated dual-channel fNIRS sensor and dual-channel dry-EEG sensors

Generation of neurobehavioral stress-monitoring electrophysiological activity (EEG) and cortical oxygenation (fNIRS) parameters

Validated through multiple experimental data sets

Obtained high-reproducibility EEG/fNIRS stress monitoring response for enhanced behavioral state assessment automation

FUTURE PLANNED DEVELOPMENTS

PLANNED POST-PHASE II PARTNERS

None at this time

PLANNED/POSSIBLE MISSION INFUSION

Possible application in sleep monitoring, mental performance/stress assessment

PLANNED/POSSIBLE COMMERCIALIZATION

Possible application in sleep monitoring, mental performance/stress assessment, psychiatric disorders and brain injury.

CONTRACT (CENTER)	Contract # NNX13CJ01C (JSC)	SOLICITATION-PHASE	SBIR/STTR2010-1 - Phase 2
SUBTOPIC	X13.01 Behavioral Health Monitoring Tools	TA	Behavioral Health

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IN OUT

SBIR / STTR

Small Business Innovation Research / Small Business Technology Transfer