

Using EEG (SS-EPs) to characterize the brain activity in response to textured stimuli in passive touch

Full Text
Sign-In or Purchase

Need Full-Text?

See if your organization qualifies for a FREE TRIAL

3 Author(s)

Moungou, A. ; Inst. of Neurosci., Univ. catholique de Louvain, Brussels, Belgium ; Thomard, J.-L. ; Mouraux, A.

Abstract	Authors	References	Cited By	Keywords	Metrics	Similar
----------	---------	------------	----------	----------	---------	---------

When sliding our fingertip on a surface, complex vibrations are produced in the skin. In the present study, we used electroencephalography (EEG) to record steady-state evoked brain potentials (SS-EPs) and characterize the cortical activity related to the passive tactile exploration of textured surfaces. In a first experiment, the right index fingertip was passively scanned against square-wave gratings having a spatial period (SP) ranging between 0.4 and 1.6 mm, using a constant normal force (1.5N) and two constant exploration velocities (17.6 mm/s, 48 mm/s). The movement of the grating was achieved using a robot with a feedback force sensor. Depending on the SP, we expected that these dynamic stimuli would elicit SS-EPs at frequencies ranging between 11 and 120 Hz and, possibly, their harmonics. We found that consistent SS-EPs can be recorded at the lowest frequency (11 Hz). In a second experiment, the fingertip was scanned against a 3.52 mm sinusoidal grating onto which a textured fabric was glued. We found that periodically modulating the magnitude of texture-induced high-frequency vibrations can elicit a measurable SS-EP in the recorded EEG. Our results suggest that SS-EPs could be used to isolate and study the brain responses related to the tactile exploration of textures.

Published in:
World Haptics Conference (WHC), 2015 IEEE

Date of Conference:
22-26 June 2015

Page(s):
113 - 118

INSPEC Accession Number:
15347133

Conference Location :
Evanston, IL

DOI:
10.1109/WHC.2015.7177700

Publisher:
IEEE

IEEE Access

Full-Open Access Journal

Would you give your child a cell phone?

Comment Now on this controversial topic in IEEE Access.

5 Yr Old

Comment

The journal for rapid open access publishing.

IEEE