<center>**Research Topic for the ParisTech/CSC PhD Program**</center>

*Field (cf. List of fields below): 6.   Information and Communication Sciences and Technologies

Subfield: (Applied Physics, Chemistry, Mathematics, Mech. Eng. etc…) Robotics

Title: Socio-Affective Touch in Robotics

ParisTech School: ENSTA ParisTech

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Short description of possible research topics for a PhD: (10-15 lines in English + optional figure)
It is well known from the social sciences and medical literature that stimulation of the skin senses can exert beneficial physiological and psychological effects. Several zones that respond optimally to gentle, slow moving touch are likely to play a direct and significant role in social interactions. The goal of this thesis is the understanding of which human body zones, respond better to different force/velocity stroking/rubbing touch. This work is conducted in a human-robot interaction context. During the thesis a robotic touch system (glove, skin) will be developed. The robotic system will exhibit a socio-affective touch behavior and will adapt its behavior to the context and human user emotional state (based on the valence/arousal spectrum) and profile (personality, preferences, etc.). A model defining social touch will be developed and several machine learning techniques will be used. This PhD subject is at the frontier of social sciences, neurosciences, mechatronics, and robotics.

Required background of the student: (Which should be the main field of study of the applicant before applying): Information and Communication Sciences and Technologies/ Robotics.

A list of 5(max.) representative publications of the group: (Related to the research topic)

1. Orefice, P.H., Hafez., M., Ammi, M., and **Tapus, A**. (2018) "Pressure Variation Study in Human-Human and Human-Robot Handshakes: Impact of the Mood", In Proceedings of the 27th IEEE International Conference on Robot and Human Interactive Communication (RO-MAN) 2018, Tai'an, China, August 2018.
2. Agrigoroaie, R., Cruz-Maya, A., and **Tapus, A.** (2018) "Oh! I am so sorry!": Understanding User Physiological Variation while Spoiling a Game Task", In Proceedings of the 2018 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2018), Madrid, Spain, October 2018
3. Orefice, P.H., Hafez., M., Ammi, M., and **Tapus, A**. (2016) " Let's Handshake and I'll Know who You Are: Gender and Personality Discrimination in Human-Human and Human-Robot Handshaking Interaction", In Proceedings of the Humanoids International Conference, Cancun, Mexico, November 2016