Soutenance d'une thèse de doctorat
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La soutenance a lieu publiquement

Candidat	MME. THETPRAPHI Kritsadi
Fonction	Doctorant
Laboratoire INSA	LGEF
Ecole Doctorale	ED160 : ELECTRONIQUE, ELECTROTECHNIQUE, AUTOMATIQUE
Titre de la thèse	« Development of Electroactive Polymer Actuators for Next Generation Mirror: Live-Mirror »
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Lieu de soutenance	Amphithéâtre AE2 (Bâtiment Gustave Ferrié) (Villeurbanne)

Composition du Jury

Civilité	Nom	Prénom	Grade / Qualité	Rôle
M.	CAVAILLE	Jean-Yves	Professeur Emerite	Examinateur
M.	DANTRAS	Eric	Maître de Conférence HDR	Rapporteur
M.	PUTSON	Chatchai	Research Engineer	Rapporteur
M.	USON	Juan	Professeur	Examinateur
MME.	LANGLOIS	Maud	Directrice de Recherche	Examinatrice
M.	PETIT	Lionel	Professeur	Directeur de thèse
M.	CAPSAL	Jean-Fabien	Maître de conférence	co Directeur de thèse
MME.	COLIN	Annie	Professeur	Examinatrice

Résumé

LiveMetaOptics presented the Exo-life finder (ELF) telescope combined with the hybrid dynamic structure of live and light active mirror named as "Live-mirror". Recently we reported the idea of active optical surface correction using the advantage of an electromechanical stimulator call electroactive polymers (EAPs) to deform mirror surface in a significant correction scale. EAPs have been currently attracted a great deal of interest in actuator devices. Thanks to their high flexibility, easy control, simple integration, and possible to be 3D printed. Such materials seem to be very promising in additive manufacturing whose recent advances become far more widespread and it offers exciting opportunities for future development. Here, we take advantage of the outstanding electromechanical coupling properties of terpolymer P(VDF-TrFE-CFE), particularly when doped with plasticizer, e.g. Diisononyl phthalate (DINP). This doped terpolymer creates a large strain response as well as excellent mechanical energy density under relatively low electric fields. Live-mirror team, we demonstrated the possibility to create dynamic surface correction faster and at lower production costs. Moreover, we proposed potentially an upgraded EAP fabrication process by using additive manufacturing via 3D-Printing technology. Full 3D print of modified EAP was formulated with plasticized terpolymer for an active layer and terpolymer/CB composite for printed electrodes. As a result of material modification coupled with 3D printing technology, we can increase productivity while enabling a mass and cost reduction and an increase of the functionality part in terms of the real application.