

Project description

Graduation assignment

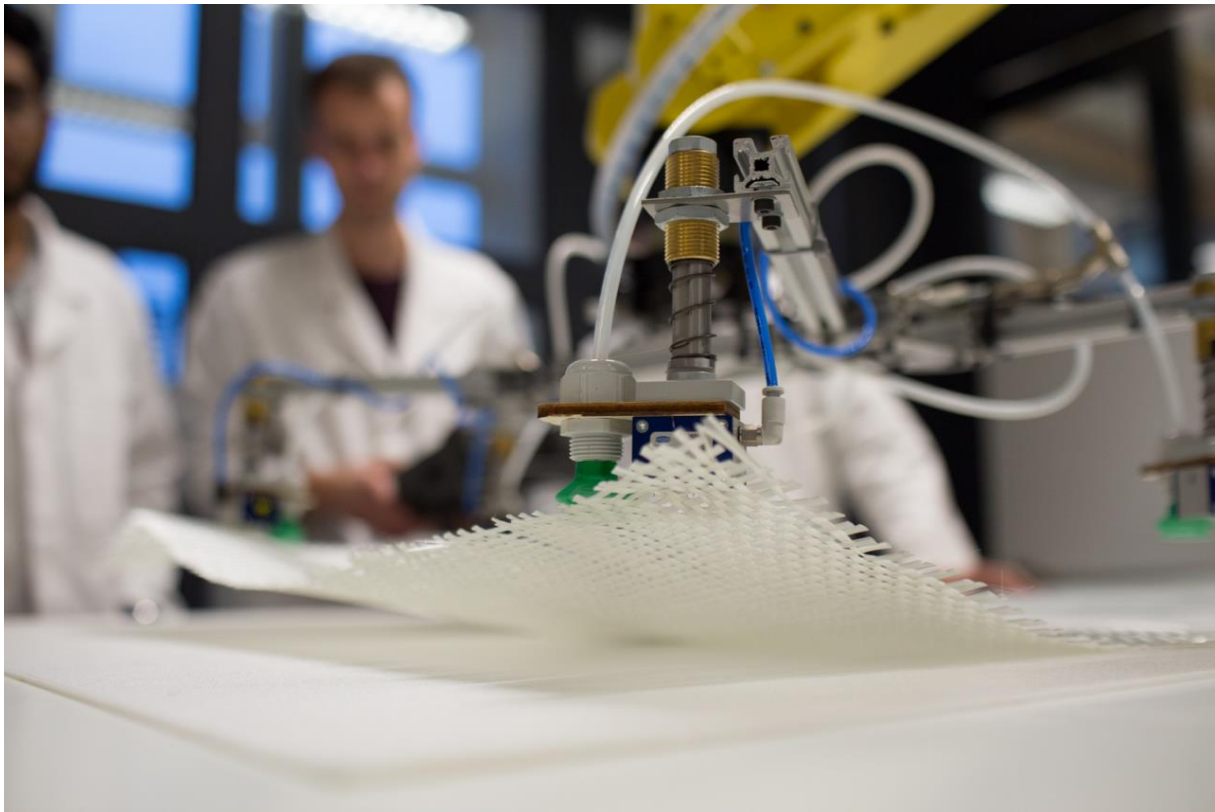
Student :
Start date : 1st of February 2017
Duration : ± 800 working hours

Company : Inholland Composites
Client : Inholland Composites

Date 12th of Dec 2016

Motivation

Inholland Composites is involved in multiple research projects in the field of composites that mainly revolve around three major themes including automation of composite production, repair of composite structures and bio-based composites. These research projects are usually carried out with partner institutes and a consortium of Small to Medium sized Enterprises (SMEs). One such project that was recently completed by Inholland Composites is the RAAK project titled “RoboCompo”. This project investigated the possibilities of automation in the infusion process. As part of the project, Inholland composites delivered a demonstrator that used a robot arm to automate various steps that are typical in an infusion process. Another project that is currently being carried out is titled “Complaid” and this project focuses on structural repairs of composite parts for the Dutch automotive industry. We are interested in combining the two themes into one project that involves automation of composite repairs.



Goal

Investigate the possibilities of automation of repair processes and sub-processes and deliver a demonstrator using the robot arm.

Objective

The aim is to investigate the possibilities of automating a composite repair process and integrating the robot arm available at the lab into the proposed solution. Existing solutions for automated repair have to be investigated for each step that is taken in a typical repair scenario and preferably a demonstrator needs to be delivered at the end of the graduation period. Knowledge regarding a typical composite repair process is already available on site in theoretical and practical format.

Scope of work

- Research proposal and project plan
- Literature study; research into repair methods and processes, automation possibilities of each method; required tooling etc.
- Programming the robot arm to execute the repair process
- Conceptual + detailed design of an automated repair system for SMEs
- Demonstrator and testing of repaired laminates
- Graduation report

Company information

Inholland Composites, located in Delft and Alkmaar, is a very well equipped, high-tech laboratory in the field of composite materials and structures. The focus is on fibre reinforced plastics which provide durable and lightweight solution in a wide range of applications. Inholland Composites has a close relationship with the Inholland Aeronautical Engineering faculty with the mission to put theory into practice and provide students with current education which connects to today's business. Additionally the Composites Laboratory does research and development for the public and private sector and provides courses for educational institutions and businesses on the use and application of composite materials.

Date: 1-12-2016

Checked by: A. Koetje

Written by: Moiz Ur Rehman