INTERNATIONAL WORKSHOP on AUTONOMOUS REMANUFACTURING
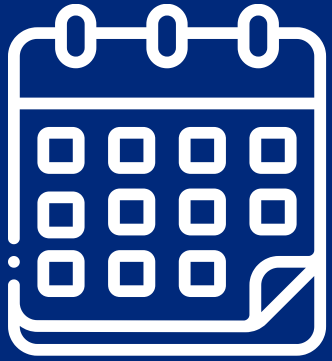
18-19 October

Caserta ITALY

VII International Workshop on Autonomous Remanufacturing
Organized by
Management Engineering Course Coordination
Department of Engineering **-** *University of Campania "Luigi Vanvitelli"*
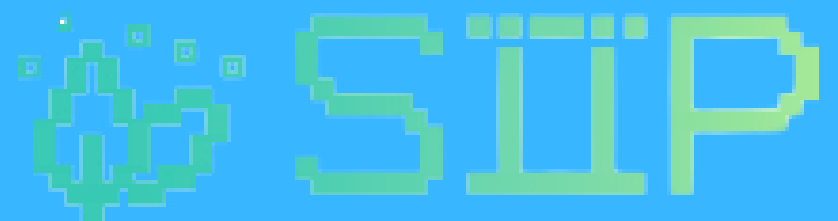
Caserta, Italy, 18-19 October 2023

UNIVERSITY OF BIRMINGHAM

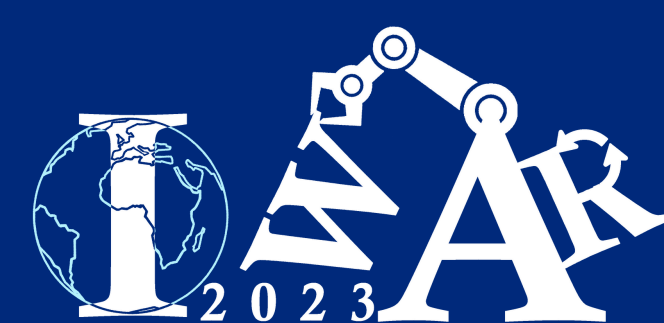Università degli Studi della Campania *Luigi Vanvitelli*

Conseil Européen de Remanufacture

SIIP

AIDI
Associazione Italiana Docenti Impianti Industriali

ASPIRE ENGINEERING

mare group

BORG AUTOMOTIVE GROUP

PROGRAM
Time zone: Central European Time (CET; UTC+01:00)

All the sessions will be held in blended mode, in-person and online

DAY 1 - WEDNESDAY, OCTOBER 18, 2023

From 8:30	Attendees' Welcome & Registretion
8:45 - 9:15	Opening Ceremony
9:15 - 9:45	KEYNOTE 1 - Fernand Weiland Founder of the APRA (Automotive Remanufacturer Assoc.) European Division
9:45 - 10:15	KEYNOTE 2 - Prof. Jeremy L. Rickli Associate Professor at Wayne State University
10:15 - 10:35	*COFFEE BREAK*

SESSION 1 : Collaborative robotics
Chair : Prof. Salvatore Miranda (University of Salerno)

10:35 - 10:50	*Integration of augmented reality and digital twins in a teleoperated disassembly system* Feifan Zhao and Duc Truong Pham
10:50 - 11:05	*Game theoretic model based Human Robot Collaboration in Waste MP (Multi peripheral imaging) device disassembly for Remanufacturing* Anjan Choudhury, Ankita Ray, Amit Karmarkar
11:05 - 11:20	*Human-Robot Collaboration for Screw Removal for Product Remanufacturing* Weidong Li
11:20 - 11.35	*Cognitive digital twin modeling of robotic disassembly process* Lei Qi, Hang Yang, Jiayi Liu, Wenjun Xu, Yi Zhong
11:35 - 11:50	*Digital Twin-based Energy-Efficient Trajectory Optimization for Robotic Pick-and-Place Process under Uncertain Payload* Wen Yao, Wenjun Xu, Jiayi Liu, Hang Yang, Zude Zhou

SESSION 2 : Digital Twin for Remanufacturing solutions
Chair : Prof. Michael Packianather (Cardiff University)

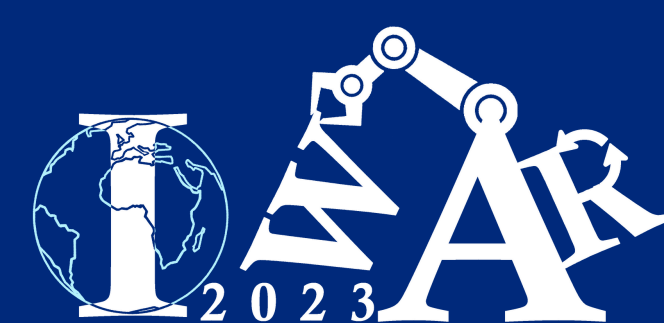|	
12:00 - 12:15	*Artificial Intelligence in remanufacturing contexts: current status and future opportunities* Valentina De Simone, Gerardo Luisi, Raffaele Abbate, Salvatore Miranda
12:15 - 12:30	*IoT-driven Digital Twin for Improved Product Disassembly in Remanufacturing* Celia Garrido-Hidalgo, Luis Roda-Sanchez, F. Javier Ramírez, Teresa Olivares
12:30 - 12.45	*Knowledge-driven Scheduling of Digital Twin-based Flexible Ship Pipe Manufacturing Workshop* Hongmei Zhang, Sisi Tian, Ruifang Li, Wenjun Xu, Yang Hu
12:45 - 13:00	*The Role of Simulation-Based Optimizations in Remanufacturing and Reverse Logistics: A Systematic Literature Review* Laura Monferdini, Benedetta Pini, Letizia Tebaldi, Barbara Bigliardi, Eleonora Bottani
13:00 - 14:00	*LUNCH*

PROGRAM

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DAY 1 - WEDNESDAY, OCTOBER 18, 2023

14:00 - 14:30	KEYNOTE 3 - Prof. Jun Huang School of Mechanical and Electronic Engineering at Wuhan University of Technology

SESSION 3 : New design methods for Remanufacturing
Chair : Prof. Miguel Afonso Sellitto (Unisinos)

14:45 - 15:00
Development of depositions strategies for edge repair using a WAAM process
Francesco Baffa, Gustavo Carvalho, Giuseppe Venturini, Gianni Campatelli

15:00 - 15:15
Product Design Evaluation of Refrigerators to Facilitate Remanufacturing Process
Didik Wahjudi, Ir Yonatan Yamin

15:15 - 15:30
The importance of design for remanufacture in achieving Net Zero
Kingsley Oturu, Chukwumaobi Kingsley Oluah

15:30 - 15.45
RE-AM combined use to facilitate decision-making in remanufacturing
Alessandro Greco, Pasquale Manco, America Califano, Salvatore Gerbino

15:45 - 16:00
Manufacture of a new sustainable material from bacterial cellulose from organic waste in a circular economy framework
Cristina Moreno-Díaz, Piera Maresca, Marcello Fera, Salvador González-Arranz

16:00 - 16:15
Tools and methods for designing mechanical components for multiple remanufacturing cycles in agricultural machinery
Stefano Beneduce, Amelia Felaco, Mario Munno, Francesco Caputo

SESSION 4 : Circular Economy for remanufacturing
Chair : Prof. Jeremy Rickli (Wayne State University)

16:25 - 16:40
Development of sustainable remanufacturing systems: literature review
Paraskeva Wlazlak, Kerstin Johansen

16:40 - 16:55
Modelling Remanufacturing Process of End-of-Life Batteries using Discrete Event Simulation
Michael Packianather

16:55 - 17:10
Circular Economy and Autonomous Remanufacturing for End-of-Life Offshore Wind Turbines
Mahmoud Shafiee

17:10 - 17.25
Exploring Industry 5.0 for remanufacturing of lithium-ion batteries in electric vehicles
A. Neri, M. A. Butturi, L. Tomasin da Silva, F. Lolli, R. Gamberini, M. A. Sellitto

17:25 - 17:40
Integrating Remanufactured and 3D parts in asset maintenance improvement
James Wakiru, Peter Muchiri

17:40 - 17:55
A framework for supporting Remanufacturing plans and activities within Industry 4.0
A. Dimitrokalli, G.-C. Vosniakos, P. Benardos, E. Matsas

18:00	*Transfer by bus*
19:00 - 23:00	*Gala Dinner*

PROGRAM

DAY 2 - THURSDAY, OCTOBER 19, 2023

8:30 - 9:00	**KEYNOTE 4 - Eng. Lorenzo Gaspari** Business Development Manager at BORG Automotive Group
9:00 - 9:30	**KEYNOTE 5 - Prof. Pai Zheng** Hong Kong Polytechnic University

SESSION 5 : Quality for Remanufacturing: Inspection and prediction
Chair : Prof. Jun Huang (Wuhan University)

09:40 - 09:55	*Ensemble learning for estimating remaining useful life: incorporating linear, KNN, and Gaussian process regression* Nima Rezazadeh, Donato Perfetto, Alessandro De Luca, Francesco Caputo
09:55 - 10:10	*Image-Based Incremental Learning for Part Recognition of Used Automotive Cores in Reverse Logistics* Marian Schlüter, Vivek-Prabhakar Chavan, Jan Lehr, Ole Kröger, Clemens Briese
10:10 - 10:25	*Surface defect recognition and invalidation judgment of remanufactured gears based on machine vision* Fulin Wang, Xiyuan Leng, Nengyi Tang
10:25 - 10:40	*Compact Convolutional Transformer for Bearing Remaining Useful Life Prediction* Zhongtian Jin, Chong Chen, Qingtao Liu, Aris Syntetos and Ying Liu
10:40 - 10:55	*Structural Health Monitoring based on guided waves for remanufactured components: numerical investigation* Antonio Aversano, Antonio Polverino, Giuseppe Lamanna
10:55 - 11:10	*Surface Defect Detection of Remanufactured Products by using the Improved Yolov5* Weice Sun, Zhengqing Liu, Qiucheng Wang, Bingbin Zhu

11:10 - 11:30	*COFFEE BREAK*

SESSION 6 : Operations management in Remanufacturing
Chair : Prof. Valentina Di Pasquale (University of Salerno)

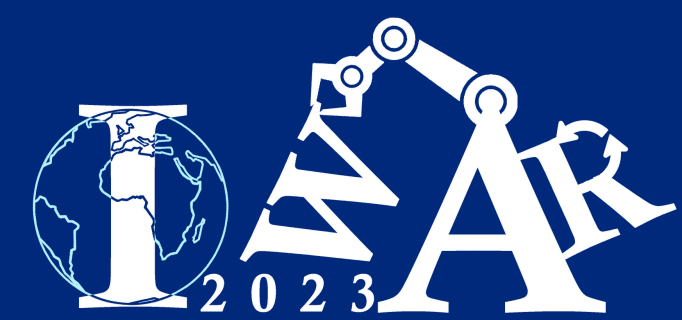| 11:30 - 11:45	*OPC UA Discovery-driven Dynamic Reconfiguration of Robotic Manufacturing Systems: Method and Deployment* Zhijian Yang, Xun Ye, Ruifang Li, Wenjun Xu
11:45 - 12:00	*Consumer Acceptance and Preferences Based On Environment Knowledge To Inform Remanufacturing End-of-Life Approach for Electric Vehicle Battery: A Scoping Review Study* Okorie O., Omolo M., Oyetola O., Emodi N. V., Singh Y., Cornish, R.
12:00 - 12:15	*Science Mapping Analysis for the Development of a Remanufacturing Readiness Model* Saverio Ferraro, Alessandra Cantini, Leonardo Leoni, Filippo De Carlo
12:15 - 12:30	*Knowledge Graph-driven Manufacturing Resources Recommendation Method for Ship Pipe Manufacturing Workshop* Zijun Zhang, Sisi Tian, Ling Peng, Ruifang Li, Wenjun Xu
12:30 - 12:45	*Life Cycle Costing of food technologies: A Case Study of a Milling Plant* Giorgia Casella, Laura Monferdini, Barbara Bigliardi, Eleonora Bottani
12:45 - 13:00	*Digital Twin-driven Dynamic Scheduling Cloud Platform for Disassembly Workshop* Jie Jiao, Gang Yuan, Xiaojun Liu, Guangdong Tian, Duc Truong Pham

13:00 - 14:00	*LUNCH*

PROGRAM

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DAY 2 - THURSDAY, OCTOBER 19, 2023

SESSION 7 : Disassembly for Remanufacturing
Chair : Prof. Fabio Fruggiero (University of Basilicata)

14:00 - 14:15	*An analysis of dual peg-hole disassembly problems* Farzaneh Goli, Yongquan Zhang, Yongjing Wang, Mozafar Saadat
14:15 - 14:30	*Exploring in Slicing Technology to Assist and Facilitate Robotic Disassembly* Kok Weng Ng, Hui Yin Chin, Mei Choo Ang, Jianbang Liu, Ah-Lian Kor, Meshal Iqbal Shah
14:30 - 14:45	*Robotic Disassembly Sequence Planning and Line Balancing - Research Trends Review and Bibliometric Analysis* Natalia Hartono, D.T. Pham
14:45 - 15:00	*Disassembly Strategies for Remanufacturing: Experiences from a Learning Factory* Jenny Coenen, Hugo Makkink, Mirjam Zijderveld

SESSION 8 : Closed-loop supply chains and reverse logistics
Chair : Prof. Eleonora Bottani (University of Parma)

15:10 - 15:25	*Assessing the impact of remanufacturing and industrial symbiosis on supply chain dynamics in the pursuit of a circular economy* Rebecca Fussone, Salvatore Cannella, Roberto Corsini, Jose Manuel Framiñan
15:25 - 15:40	*Impact of Incentive Policies on the Profitability of Manufacturers and Third-Party Remanufacturers in the Circular Economy* Xiaomei Sun, Chao Wang
15:40 - 15:55	*A Model for Remanufacturing Process Planning under Quality Loss and Emissions Constraint with Multi-graded of Incoming Core* Mohamad Imron Mustajib, Udisubakti Ciptomulyono, Nani Kurniati
15:55 - 16:10	*Analysis of strategies and models for industrial symbiosis in manufacturing ecosystems* Valentina Di Pasquale, Mario Caterino, Stefano Riemma, Marta Rinaldi, Raffaele Iannone

16:10 - 16:30	*Closing Cerimony*
16:30	*Transfer to the "REGGIA" (Royal Palace)*
17:00 - 19:00	*Social Event : visit to the "Reggia di Caserta"*
19:00 - 22:00	*Dinner (PIZZA)*