

# VR@P 2009



## Conference Programme

Leiria, Portugal  
October, 2009



10:00	Main	<b>Conference Registration</b>
12:30	Auditorium	
14:00	Main	<b><u>RM Platform Meeting</u></b>
15:30	Auditorium	
<i>See the agenda below</i>		
15:30		Coffee Break
15:45		
15:45	Main	<b><u>RM Platform Meeting</u></b>
18:00	Auditorium	
<i>See the agenda below</i>		
20:00	Castle of Leiria	Conference Reception

**Agenda:**

- News from the RM Platform: updated objectives and activities – Frits Feenstra / Martin Schafer
- Status of Factories of the Future (FoF) and European Factories of the Future Research organization (EFFRA) – Arun Junai
- ASTM activities – Brent Stucker
- European initiatives on standardisation
- Brokerage Event (related projects to FP 7 e.g. NMP, PPP, Research for SME; searching partners for the next call; new ideas for projects for upcoming calls) – All



**Wednesday, 7th of October 2009**

9:00	Main	<b>Opening Session</b>
9:15	Auditorium	
9:15	Main	<b>Keynote:</b> Terry Wohlers – Wohlers Associates, USA
10:00	Auditorium	
10:00	Main	<b>Keynote:</b> Dietmar Hutmacher – Queensland University of Technology, Australia
10:45	Auditorium	
10:45		<b>Coffee Break</b>
11:00		
11:00	Main	<b>Biomanufacturing 1</b> <b>Chair:</b> Chua Chee Kai, Nanyang Technological University, Singapore
12:45	Auditorium	
		Craniofacial defects – reconstruction by use of rapid prototyping <i>R. Schumacher, C. Kunz, C. Jaquier, H. Rotaru, H. Stan, H.F. Zeilhofer &amp; E. Schkommodau</i>
		Digital design and rapid manufacturing in orbital wall reconstruction <i>M. Salmi, J. Tuomi, K. Paloheimo, M. Paloheimo, R. Björkstrand, A.A. Mäkitie, K. Mesimäki &amp; R. Kontio</i>
		Analysis and Fabrication of New Designed Dental Implant using Rapid Prototyping Technology <i>S. Rahmati, H. Kheirollahi &amp; A. Azari</i>
		A benchmark for accuracy evaluation of dental crowns up-to-date manufacturing <i>E. Atzeni, L. Iuliano, P. Minetola, A. Salmi &amp; A. Gatto</i>
11:00	Auditorium	<b>Materials 1</b> <b>Chair:</b> Frank Ansorge, Fraunhofer IZM, Micro-Mechatronic Center, Germany
12:45	1	
		Extrusion Behavior of Chocolate for Additive Layer Manufacturing <i>L. Hao, O. Seaman, S. Mellor, J. Henderson, N. Sewell &amp; M. Sloan</i>
		Series production of CE-certified orthopaedic implants with integrated network structures for improved bone ingrowth <i>P. Cremascoli &amp; P. Ohldin</i>
		Rapid Manufacturing of Polycaprolactone / Progesterone Drug Delivery Device by SLS <i>G.V. Salmoria, P. Klauss, R.A. Paggi, M. Souza, L.A. Kanis &amp; K.M. Zepon</i>
		On Mechanical Properties of SFF-made Calcium Polyphosphate Bio-Structures <i>Y. Shanjani &amp; E. Toyserkani</i>

11:00 12:45	Auditorium 2	<p><b>Virtual environments and simulation 1</b>  <b>Chair:</b> Ian Gibson, National University of Singapore and CDRsp, Portugal</p>
		An Interactive Multimedia Approach to Enhance Learning of Rapid Prototyping <i>C.K. Chua, T.T. Vu, K.F. Leong &amp; C.S. Lim</i>
		Adaptive Logistics: Simulation based decision making in assembly planning and –control <i>A. Kampker, G. Schuh, B. Franzkoch, T. Potente &amp; T. Welter</i>
		A holistic approach for customer-oriented product engineering of micro devices <i>K. Hahn, T. Schmidt, R. Brück, D. Orloff &amp; J. Popp</i>
		Construction of Immersive Multi-projection Environments for Treatment of Phobia of Heights <i>H.M.C Vale, C. Oliveira, D.C. Sena &amp; A.J.V. Porto</i>
12:45 14:00		<b>Lunch Break</b>
14:00 14:45	Main Auditorium	<b>Keynote:</b> Gideon Levy – Inspire IRPD, Institute for Rapid Product Development, Switzerland
14:45 15:30	Main Auditorium	<b>Keynote:</b> Richard Hague – Loughborough University, UK
15:30 15:45		<b>Coffee Break</b>
15:45 18:00	Main Auditorium	<p><b>Advanced rapid prototyping technologies and nanofabrication 1</b>  <b>Chair:</b> Gaelle Vanard, Airbus, UK</p>
		Interface Attachibility Analysis of Printed Patterns through Electrostatic Inkjet System <i>A. Ali, A. Rahman, K.H. Choi, B.S. Yang &amp; D.S. Kim</i>
		Internal structure Optimization for Fused Deposition Modeling ABS Parts <i>L.M. Galantucci, F. Lavecchia &amp; G. Percoco</i>
		The production of Ti-6Al-4V parts with controlled porous architecture by three-dimensional fiber deposition <i>M. Rombouts, S. Mullens, J. Luyten, P. Nuyts &amp; M. Schroeven</i>
		The future of electronic products: conductive 3D Printing? <i>O. Diegel, S. Singamneni, B. Huang &amp; I. Gibson</i>
		Embedding Of Electronic And System In Package Using Generative Processes <i>F. Ansoerge, K. Heumann, D. Ifland &amp; H. Reichl</i>
15:45 18:00	Auditorium 1	<p><b>CAD and 3D data acquisition technologies 1</b>  <b>Chair:</b> Maura Mengoni, Polytechnic University of Marche, Ancona, Italy</p>
		Reverse Innovative Design in Rapid Modelling and Reverse Engineering Industrial Applications <i>A.E. Sonn &amp; D.M. Dimitrov</i>
		Global approach to design and manufacture Direct Parts <i>J. Kerninon, P.Mognol &amp; J.Y.Hascoët</i>
		Rapid Prototyping models of fetuses built from Ultrasound 3D and Magnetic Resonance files <i>J.R.L. Santos, J.R.L. Santos, R.C. Fontes, S. Campbell &amp; H. Werner</i>
		Novel Methodology in Design of Custom-made Hip Prosthesis <i>F. Abbaszadeh, S. Rahmati, F. Farahmand &amp; R. Fatollahzadeh</i>

		Image based modeling and morphological analysis of the human knee <i>G. Renner &amp; L. Hajder</i>
15:45 18:00	Auditorium 2	<b>Rapid tooling and manufacturing 1</b> <b>Chair:</b> Terry Wohlers, Wohlers Associates, USA
		Challenges and Opportunities in obtaining Rapid Ceramic Components by means of Subtractive Methods applied to Non Sintered Materials <i>J.R. Gomà-Ayats, J. Minguella-Canela &amp; R. Uceda-Molera</i>
		An automated method for RM feasibility evaluation <i>J. Munguía &amp; F. Fenollosa</i>
		Rapid Manufacturing in Automation Applications <i>R. Becker &amp; A. Grzesiak</i>
		Rapid Manufacture of Dies and Moulds using Fused Deposition Modeling and Electrical Discharge Machining <i>S. Singamneni, O. Diegel, D.P.K. Singh &amp; A.R. Chowdhury</i>
		Direct Rapid Tooling for Die Forging – a new challenge for Layer-Based Technologies <i>R. Neugebauer, B. Mueller &amp; A. Wagner</i>
15:45 18:00	Auditorium 3	<b>Applications 1</b> <b>Chair:</b> Andrea Gatto, University of Modena and Reggio Emilia, Department of Mechanical and Civil Engineering, Modena, Italy
		Design for Rapid Manufacturing - Capturing Designers' Knowledge <i>S. Maidin, R.I. Campbell, I. Drstvensek &amp; P. Sever</i>
		Layer Manufacturing of Magnesium and its alloy structures for Future Applications <i>M.M. Savalani, C.C. Ng, H.C. Man &amp; I. Gibson</i>
		Digital technologies and the potential for CNC texturing the built environment <i>T.J. Miller</i>
		Technology transfer in digital prototyping by means of research laboratories: two case studies in architecture schools <i>G. Celani, R. Pupo &amp; J. Duarte</i>
		Design of a micro-channel reactor for decomposition of organic pollutants in waste water treatment <i>G. Charles, S. Corbel, M-C. Carré, T. Roques-Carnes &amp; O. Zahraa</i>
		Concurrent design and development of a chassis set for an electromechanical transmission system <i>F. Fenollosa-Artés, J. Minguella-Canela &amp; J. R. Gomà-Ayats</i>
18:00	Main Auditorium	<b>Classic Music</b>



9:00	Main Auditorium	<b>Keynote:</b> David Rosen – Georgia Institute of Technology, USA
9:45	Main Auditorium	<b>Keynote:</b> Jan Vandenbrande – Boeing, USA
10:30		<b>Coffee Break</b>
10:30		
10:45	Main Auditorium	<b>Advanced rapid prototyping technologies and nanofabrication 2</b> <b>Chair:</b> António Pontes, University of Minho, Portugal
12:45		3D Microstructuring of Hybrid Organic-inorganic Materials by Two-Photon Polymerization Technique <i>A.Ovsianikov, B. Chichkov, M. Oubaha, R. Copperwhite, B.D. MacCraith, A. Gaidukeviciute, I. Sakellari, A. Giakoumaki, D. Gray, M. Vamvakaki, M. Farsari &amp; C. Fotakis</i>
		Hibrid Organic-Inorganic Nanocomposite for Infrared Laser Stereolithography Process <i>M.I.R. Barbosa, A.L. Jardim, M.C.B. Costa, R.A. Rezende &amp; R. Maciel Filho</i>
		Printing high viscosity fluids using ultrasonic droplet generation <i>D. Rosen</i>
		Additive manufacturing of components out of copper by selective laser melting <i>D. Becker</i>
		Simulation based Multi-Objective Optimisation Model for the SLS Process <i>A.K. Singh &amp; R.S. Prakash</i>
10:45	Auditorium 1	<b>Virtual environments and simulation 2</b> <b>Chair:</b> Olaf Diegel, Centre for Rapid Product Development, Auckland University of Technology, New Zealand
12:30		Potential of Building Information Modeling (BIM) system <i>M. R. Oliveira</i>
		Context information complemented virtual prototyping of factories <i>A. Kampker, G. Schuh, A. Hoeschen &amp; J. Nöcker</i>
		A Multi-agent Based Dynamic Scheduling Framework for Virtual Enterprises <i>S.H. Niu, S.K. Ong &amp; A.Y.C. Nee</i>
		A model for project-based environmental compliance management for small and medium enterprises <i>E.C.K. Chan &amp; K.M. Yu</i>

10:45 12:30	Auditorium 2	<p align="center"><b>Rapid tooling and manufacturing 2</b></p> <p><b>Chair:</b> Pascal Mognol, Institut de Recherche en Communications et CYbernetique de Nantes, France</p>
		An approach to develop a rapid manufacturing knowledge-based environment <i>T. Laoui</i>
		Cooling channel configuration in Injection Moulds <i>D. Dimitrov, A. Moammer &amp; T. Harms</i>
		The influence of the mould material on the rheology and mechanical characteristics of hybrid injection moulds <i>L. Cardon, A. Dekeyser, M. Moerman, S. Vernailen &amp; K. Ragaert</i>
		Warpage of injection mouldings in hybrid moulds with epoxy-aluminium composite core <i>M.A. Silva, P.G. Martinho &amp; A.S. Pouzada</i>
12:30 14:00		<b>Lunch Break</b>
14:00 14:45	Main Auditorium	<b>Keynote:</b> Brent Stucker – Utah State University, USA
14:45 15:30	Main Auditorium	<b>Keynote:</b> Alain Bernard – École Centrale de Nantes, France
15:30 16:15	Main Auditorium	<b>Keynote:</b> Lin Li – University of Manchester, UK
16:15 16:30		<b>Coffee Break</b>
16:30 18:45	Main Auditorium	<p align="center"><b>Applications 2</b></p> <p><b>Chair:</b> Gabor Renner, Technical University, Budapest, Hungary</p>
		A surgical training model manufacture using rapid prototyping technology <i>L. Queijo, J. Rocha, L. Barreira, T. Barbosa, P.M. Pereira &amp; M.S. Juan</i>
		A Novel Methodology in Design and Fabrication of Lingual Orthodontic Appliance Based on Rapid Prototyping Technologies <i>H. Kheirollahi, S. Rahmati &amp; F. Abesi</i>
		Design of customised bioceramic medical implants by layered manufacturing <i>S.F. Khan &amp; K.W. Dalgarno</i>
		3D-Digitalization of ankle movement and 3D-CAD-method for patient specific external ankle support development and Rapid Manufacturing <i>R. Björkstrand, J. Tuomi, M. Paloheimo, J. Lindahl &amp; J. Salo</i>
		Study of materials applied to an orthopaedic external circular fixator <i>C. Capela, L. Oliveira, P. Camaño, P.J. Bártolo &amp; I. Garcia</i>
16:30 18:45	Auditorium 1	<p align="center"><b>Biomanufacturing 2</b></p> <p><b>Chair:</b> David Dean, Departments of Neurological Surgery, Case Western Reserve University</p>
		Indirect fabrication of tissue engineering scaffolds using rapid prototyping and a foaming process <i>J.Y. Tan, C.K. Chua &amp; K.F. Leong</i>
		The development of coated ceramic powders for the indirect sintering of medical parts <i>A. Dekeyser, S. Vernailen, K. Ragaert &amp; L. Cardon</i>
		3D plotting of thermoplastic scaffolds: the need for continuous material feed <i>K. Ragaert, L. Cardon, A. Dekeyser, M. Moerman &amp; J. Degrieck</i>

		<p>BioExtruder: Study of the influence of process parameters on PCL scaffolds properties <i>M. Domingos, F. Chiellini, A. Gloria, L. Ambrosio, P.J. Bártolo &amp; E. Chiellini</i></p> <p>Hybrid process for biomanufacturing <i>C. Mota, P.J. Bártolo, F. Chiellini &amp; E. Chiellini</i></p>
16:30 18:45	Auditorium 2	<p><b>CAD and 3D data acquisition technologies 2</b> <b>Chair:</b> António Pouzada, University of Minho, Portugal</p>
		<p>A simple photogrammetric system for automatic capture and measurement of facial soft tissues during movement <i>L.M. Galantucci, F. Lavecchia &amp; G. Percoco</i></p> <p>A robotic system for 3D optical scanning of large surfaces <i>M. Maggini, S. Barone, A. Paoli &amp; A.V. Razionale</i></p> <p>3D digitation of museum sculptures for model-making purposes: difficulties and possible solutions <i>G. Celani, L. Cancherini, A. Jardini, M. Oliveira, J.V.L. da Silva &amp; V. Piccoli</i></p> <p>A Computer Aided Design (CAD) support tool for parametric design of products for Rapid Manufacture (RM) <i>P.C. Smith &amp; A.E.W. Rennie</i></p> <p>Performance evaluation of non contact measuring systems considering bias <i>M. Cavallaro, G. Moroni &amp; S. Petró</i></p>
16:30 18:45	Auditorium 3	<p><b>Materials 2</b> <b>Chair:</b> Patrik Ohldin, Arcam AB, Sweden</p>
		<p>Laminated Object Manufacturing (LOM) of Glass Ceramics Substrates for LTCC Applications <i>C.M. Gomes, N. Travitzky, P. Greil, A. P.N. Oliveira &amp; D. Hotza</i></p> <p>Multiphase numerical modeling of metallic particle composites <i>C. Capela, J. Bolrão, F.V. Antunes &amp; P. Camaño</i></p> <p>Surface Modification and Analysis of Rapid Prototyped Ti-6Al-4V Structures <i>M. de Wild, R. Schumacher, S. Fabbri, A. Yildiz &amp; E. Schkommodau</i></p> <p>Material characterization for rapid prototyping by reactive extrusion <i>A. Mateus, P.J. Bártolo, G. Mitchell &amp; I. Gibson</i></p> <p>Experimental Investigation of Charpy Impact Test on Metallic SLM parts <i>E. Yasa, J Deckers, J.P. Kruth, M. Rombouts &amp; J. Luyten</i></p>






**Friday, 9th of October 2009**

9:00	Main Auditorium	<b>Keynote:</b> Luigi Galantucci – Politecnico di Bary, Italy
9:45	Main Auditorium	<b>Keynote:</b> Mamoru Mitsuishi – University of Tokyo, Japan
10:30		<b>Coffee Break</b>
10:30		
10:45	Main Auditorium	<b>Rapid tooling and manufacturing 3</b>
12:30		<b>Chair:</b> David Bourell, Texas University, USA
		EOS innovations for e-manufacturing: High performance polymers and integrated quality management system <i>J. Greses &amp; C.M. Stotko</i>
		Studying the repeatability in DMLS technology using a complete geometry test part <i>J. Delgado, J. Ciurana, C. Reguant &amp; B. Cavallini</i>
		Direct Fabrication of an in-situ Al Composite using Selective Laser Melting Process <i>S. Dadbakhsh, L. Hao, N. Sewell &amp; P. Jerrard</i>
		Direct Manufacturing of dense parts from martensitic precipitation hardening steel gas atomized powder by selective laser melting (SLM) technology <i>M. Averyanova &amp; P. Bertrand</i>
10:45	Auditorium 1	<b>Special Session: Innovative Sustainable Building Development</b>
12:30		
10:45	Auditorium 2	<b>Virtual environments and simulation 3</b>
12:30		<b>Chair:</b> Steinar Killi, Oslo School of Architecture and Design, Norway
		Integration of Rapid Manufacturing processes in a high-level numerical chain <i>R. Bonnard, P. Mognol &amp; J.Y. Hascoët</i>
		Towards ontology-based information extraction in distributed manufacturing systems <i>B.X. Li, L. Yang, S.K. Ong, Y. Lei &amp; A.Y.C. Nee</i>
		Using an immersive virtual environment to validate cellular manufacturing system simulation models <i>H.J.R Carvalho, C. Oliveira, H.C. Vale, D.C. Sena &amp; A.J.V. Porto</i>
		A Virtual Manufacturing System of Screw Threads Generation with Tasks Schedule Approach <i>J.S. Liang</i>

10:45 12:30	Auditorium 3	<p><b>Advanced rapid prototyping technologies and nanofabrication 3</b></p> <p><b>Chair:</b> Cynthia Gomes, University of Erlangen-Nuremberg, Germany</p>
		Build time for adaptive slicing in stereolithography <i>A.S. Nezhad, M. Vatani, F. Barazandeh &amp; A.R. Rahimi</i>
		Study and simulation of different scanning strategies in SLM <i>J. Jhabvala, E. Boillat, T. Antignac &amp; R. Glardon</i>
		A three dimensional FE-model for the investigation of transient physical effects in Selective Laser Melting <i>M.F. Zaeh, G. Branner &amp; T.A. Krol</i>
		A practical approach on temperature variation in selective laser melting with a novel heat transfer model <i>C.K. Chua, A. Liu &amp; K.F. Leong</i>
		Micro laser-milling of graphite: analysis of process parameters <i>J. Monteiro, P.J. Bártolo &amp; C. Capela</i>
12:30 14:00		<b>Lunch Break</b>
14:00 14:45	Main Auditorium	<b>Keynote:</b> Micheal Liebschner – Baylor College of Medicine, USA
14:45 15:30	Main Auditorium	<b>Keynote:</b> Horst Exner – Mittweida, Germany
15:30 15:45		<b>Coffee Break</b>
15:45 18:00	Main Auditorium	<p><b>Biomanufacturing 3</b></p> <p><b>Chair:</b> Vladimir Mironov, Department of Regenerative Medicine and Cell Biology, South Carolina, USA</p>
		Process flow for designing functionally graded tissue engineering scaffolds <i>C.K. Chua, N. Sudarmadji, K.F. Leong, S.M. Chou, S.C. Lim &amp; W.M. Firdaus</i>
		Scaffold Micro-Architecture Optimization Based on Bio-Mimetic Principles <i>A.B. Bucklen, B.M. Wettergreen &amp; C.M. Liebschner</i>
		The use of Periodic Minimal Surfaces for Scaffolds design <i>H.A. Almeida &amp; P.J. Bártolo</i>
		Medical Applications of Rapid Prototyping – from Applications to Classification <i>J. Tuomi, K. Paloheimo, R. Björkstrand, M. Salmi, M. Paloheimo &amp; A.A. Mäkitie</i>
		Intelligent biopolymer selection system for medical applications <i>C.S. Moura, P.J. Bártolo &amp; H.A. Almeida</i>
15:45 18:00	Auditorium 1	<b>Special Session: Innovative Sustainable Building Development</b>
15:45 18:00	Auditorium 2	<p><b>Virtual environments and simulation 4</b></p> <p><b>Chair:</b> Tahar Laoui, Dept of Mechanical Engineering, Saudi Arabia</p>
		New perspectives on form: real-time, virtual modeling in networked 3d environments <i>S.B. Fraser, M. Lyons, T.J. Miller, M. Barnard, H.K. Henning, J. Looser, H. Seichter &amp; M. Billingham</i>
		Products experience: how can Virtual Prototyping

		<p>improve usability testing? <i>M. Mengoni, M. Germani &amp; M. Peruzzini</i></p>
		<p>Fully GPU-based volume representation and material removal simulation of free-form objects <i>B. Tukora &amp; T. Szalay</i></p>
		<p>Low-cost gesture detection as a form of interaction in a virtual reality multi-projection system <i>C. Oliveira, D.C. Sena, H.M.C. Vale, H.J.R. Carvalho &amp; A.J.V. Porto</i></p>
		<p>“3D Faxing”: Rapid prototyping of new product and process systems to help manage multi-national development teams <i>O. Diegel, D.P.K. Singh, S. Singamneni &amp; A. Withell</i></p>
15:45	Auditorium	<b>Applications 3</b>
18:00	3	<b>Chair:</b> Jose Greses, EOS, Germany
		<p>Layer Laminating Increases the Cost Effectiveness of Custom and Standard Last Manufacturing in the Footwear Industry <i>U. Klaeger</i></p>
		<p>Cost and benefit analysis of fused deposition modelling (FDM) technique and selective laser sintering (SLS) for fabrication of customised foot orthoses <i>J.M. Saleh &amp; K.W. Dalgarno</i></p>
		<p>Form follows algorithm: Computer derived design for rapid manufacturing <i>S. Killi</i></p>
		<p>The Power of a Single Prototype: Sustainable Fashion Textile Design and the prevention of Carcinogenic Melanoma <i>J. Farrer &amp; A. Finn</i></p>
		<p>Breaking paradigms – The teaching of RM to “experienced newcomers” <i>J. Munguía &amp; M. Villegas</i></p>
20:00		<b>Gala Dinner</b>



**Saturday, 10th of October 2009**

9:00	Main Auditorium	<b>Keynote:</b> Ian Gibson – National University of Singapore, Singapore & Centre for Rapid and Sustainable Product Development, Portugal
9:45	Main Auditorium	<b>Keynote:</b> António Pouzada – University of Minho, Portugal
10:30		<b>Coffee Break</b>
10:45	Main Auditorium	<b>Biomufacturing 4</b> <b>Chair:</b> Aleksandr Ovsianikov, Laser Zentrum Hannover, Germany
12:30		A minibioreactor for developing “perfused” capillaries in cardiomyocyte aggregates <i>C.K. Chua, D. Liu, F. Leong, V. Mironov &amp; V. Kasyanov</i>
		Spinning of biomaterial microfibers for tendon tissue engineering <i>C.K. Chua, J. An, K.F. Leong, C.M. Cheah &amp; H. Chang</i>
		Fractal Tool Paths for Layered Manufacturing of Scaffolds with Matched Bone Properties <i>G.S. Kumar &amp; P. Pandithevan</i>
		Stereolithographic Rendering of Low Molecular Weight Polymer Scaffolds for Bone Tissue Engineering <i>D. Dean, J. Wallace, K. Kim, A.G. Mikos &amp; J.P. Fisher</i>
10:45	Auditorium 1	<b>Advanced rapid prototyping technologies and nanofabrication 4</b> <b>Chair:</b> Olivier Jay, Danish Technological Institute, Denmark
12:30		Construction and Adaptation of an Open Source Rapid Prototyping Machine for Biomedical Research Purposes – a Multinational Collaborative Development <i>A.L. Lixandrão Filho, P.Y. Noritomi, J.V.L da Silva, P. Inforçatti Neto, P.Y.C. Cheung, N. Colangelo, H. Kang, J.T. Buthcer &amp; E. Malone</i>
		Multi-objective optimization of part orientation to improve process planning in RM <i>S. Danjou &amp; P. Köhler</i>
		New Generation of Rapid Manufacturing Equipment <i>O. Hangaard</i>
		The Development of a Generic Rapid Prototyping Process Planning System <i>N. Volpato &amp; J.A. Foggiatto</i>

10:45 12:30	Auditorium 2	<b>Virtual environments and simulation 5</b> <b>Chair:</b> Neil Sewell, University of Exeter, UK
		Design-by-the-Customer through Virtual Reality <i>A.G. Bachvarov, S. Maleshkov, P. Stojanova &amp; J. Katicic</i>
		Virtual Reality for Assembly Simulation and Ergonomic Analysis in automotive chain of production <i>M. Cavallaro &amp; G. Moroni</i>
		Finite elements analysis of cylindrical copper shelled SLA electrodes <i>V. Iakovakis, J. Kechagias, G. Petropoulos &amp; S. Maropoulos</i>
		Biomechanical response simulation of tetrahedral mass-spring model of intervertebral disc in a spine segment with haptic interface <i>K.T. Huynh, I. Gibson &amp; W.F. Lu</i>
10:45 12:30	Auditorium 3	<b>Special Session: BIOFAB – IberoAmerican Network</b>
12:30 14:00		<b>Lunch Break</b>
14:00 14:45	Main Auditorium	<b>Keynote:</b> Olivier Jay – Danish Technological Institute, Denmark
14:45 15:30	Main Auditorium	<b>Keynote:</b> Hod Lipson – Cornell University, USA
15:30 15:45		<b>Coffee Break</b>
15:45 18:00	Main Auditorium	<b>CAD and 3D data acquisition technologies 3</b> <b>Chair:</b> Neri Volpato, Federal University of Technology, Mechanical Department, Brazil
		Use of BioCAD in the Development of a Growth Compliant Prosthetic Device for Cranioplasty of Growing Patients <i>D.T. Kemmoku, P.Y. Noritomi, F.G. Roland &amp; J.V.L. da Silva</i>
		The use of technologies as Rapid Prototyping and Scanner Inspection in surgical planning to medical application <i>C.B.L. Ulbrich, H.A. Hermini &amp; C.A.C. Zavaglia</i>
		Guided dental surgery based on integrating 3D image slicing and structured light scanning <i>S. Barone, A. Paol &amp; A.V. Razionale</i>
		Artificial teeth manufacturing: inspection of mould and teeth by contactless scanning systems <i>E. Atzeni, L. Iuliano, P. Minetola, A. Salmi &amp; A. Gatto</i>
		Comparison of CT and CBCT for Fabrication of Dentistry Models via Rapid Prototyping Technology <i>H. Kheirollahi, F. Abesi &amp; S. Rahmati</i>
15:45 18:00	Auditorium 1	<b>Materials 3</b> <b>Chair:</b> Hod Lipson – Cornell University, USA
		Selective Laser Melting of NiTi shape memory components <i>H. Meier, C. Haberland, J. Frenzel &amp; R. Zarnetta</i>
		Functionally graded PA12/MWCNTs composite fabricated by SLS to aerospace applications: mechanical and electrical behaviour <i>R.A. Paggi, G.V. Salmoria, A. Lago &amp; V.E. Beal</i>
		Production of fully ferrous components using Indirect Selective Laser Sintering <i>P. Vallabhajosyula &amp; D.L. Bourell</i>

		Densification and coarsening of laser sintered green parts by microwave technique <i>P. Veronesi, A. Gatto &amp; L. Iuliano</i>
		On the effects of build orientation in powder-fed Additive Layer Manufacture of steel 316L <i>E. Bassoli, A. Gatto, N.T. Sewell &amp; D. Johns</i>
15:45 18:00	Auditorium 2	<b>Applications 4</b> <b>Chair:</b> Martin Jenkins, University of Exeter, UK
		Efficient use of Traditional-, Rapid- and Virtual Prototyping in the industrial product development process <i>R. Bastiens, J. Detand, O. Rysman &amp; T. Deflo</i>
		Design of Ergonomic Leisure Chair <i>C. Capela, A. Cerva, &amp; P. Camaño &amp; F.V. Antunes</i>
		Application of 3D colour printing for the rapid prototyping of functional models <i>S. Junk &amp; J. Sämann-Sun</i>
		A Design increase to hospital regulator pressure <i>F. Ulbrich, C.B.L. Ulbrich &amp; C.A.C. Zavaglia</i>
		Development of a universal advertising static system for vehicle wheels <i>N. Nina, C. Capela, P. Camaño, L.M. Oliveira &amp; R. Dias</i>
15:45 18:00		<b><u>Special Session: Biofabrication in Tissue Engineering for the Year 2020</u></b>
18:00		<b>Closing Ceremony</b>