

## Conference program

### September 19, Sunday

- 09:00 – 18:00 Arrival day, registration and accommodation of conference participants
- 13:00 – 15:00 Lunch
- 15:30 – 17:30 Cultural program: bus tour of Tsarskoye Selo with a visit to the Arsenal
- 19:00 – 22:00 Welcome party

### September 20, Monday

- 08:15 – 09:30 Breakfast
- 09:30 – 10:30 Registration
- 10:30 – 11:00 Opening Ceremony of the Conference
- 11:00 – 12:10 Invited lectures
- 12:15 – 12:45 Coffee break
- 12:45 – 14:30 Invited lectures
- 14:30 – 15:30 Lunch
- 15:45 – 17:45 Master class on 3D scanning and modern measurement methods
- 18:00 – 19:00 Dinner
- 19:30 – 20:30 Tour of the Kochybey's residence

### September 21, Tuesday

- 08:15 – 09:30 Breakfast
- 10:00 – 11:40 Parallel sessions  
**Physical fundamentals and mathematic simulation of beam technologies. CAD-CAM-CAE systems.** (Conference hall)
- 11:40 – 12:00 Coffee break
- 12:00 – 13:40 **Equipment and technology for additive manufacturing** (Conference hall)  
**Equipment and technology of welding, cladding and heat treatment (Classroom # 16)**
- 13:40 – 14:40 Lunch
- 14:40 – 16:20 Parallel sessions  
**Equipment and technology for additive manufacturing** (Conference hall)

**Equipment and technology of welding, cladding and heat treatment (Classroom # 16)**

16:20 – 16:40

Coffee break

16:40 – 18:20

Parallel sessions

**Equipment and technology for additive manufacturing**

(Conference hall)

**Equipment and technology of welding, cladding and heat treatment (Classroom # 16)**

18:30 – 19:30

Dinner

**September 22, Wednesday**

08:15 – 09:15

Breakfast

10:00 – 11:40

Parallel sessions

**Physical fundamentals and mathematic simulation of beam technologies. CAD-CAM-CAE systems.** (Conference hall)

11:40 – 12:00

Coffee break

12:00 – 13:40

**Equipment and technology for additive manufacturing**

(Conference hall)

**Metrology, measuring systems and testing (Classroom # 16)**

13:40 – 14:40

Lunch

14:40 – 16:20

Parallel sessions

**Equipment and technology for additive manufacturing**

(Conference hall)

**Metrology, measuring systems and testing (Classroom # 16)**

16:20 – 16:40

Coffee break

09:30 – 11:10

Oral contributed papers

11:10 – 11:30

Coffee break

11:30 – 13:10

Oral contributed papers

13:15 – 14:00

Lunch

14:00 – 14:40

Oral contributed papers

15:00 – 15:30

Coffee break

16:40 – 18:00

Poster session

19:00 – 23:00

Ceremonial dinner

**September 23, Thursday**

09:00 – 10:00

Breakfast

10:00 – 12:00

Departure

## September 20, Monday

### Plenary session

**Chairmen – Prof. Vitaly Lopota, Prof. Gleb Turichin**

- 11:00 – 11:10 **Rakhmano A.L.** General Director of JSC "USC" Opening remarks
- 11:10 – 11:30 **Prof. G.A. Turichin**, «Industrial laser and additive technologies - from simulation to industrial implementation», Saint Petersburg State Marine Technical University, Russia
- 11:30 – 11:50 **Prof. M. Rethmeier** «Investigation of the gap bridgeability at high-power laser hybrid welding of plasma-cut thick mild steels with AC magnetic support», BAM Federal Institute for Materials Research and Testing, Germany
- 11:50 – 12:10 **Prof. I. Akhatov** «Optimization of metal 3D printing parameters using machine learning methods», Skolkovo Institute of Science and Technology, Russia

### 12:15 – 12:45 Coffee - break

- 12:50 – 13:10 **Bautmans L.**, «Additive manufacturing, new materials», Oerlikon Group, Netherlands
- 13:10 – 13:30 **Prof. A. Logacheva** « Additive technologies for metal materials in RCT products: prospects and problems of application», JSC «Kompozit», Russia
- 13:30 – 13:50 **Prof. M. Schmidt**, University of Erlangen-Nuremberg, Germany,
- 13:50 – 14:10 **Yaschkin A.** «World trends in the development of industrial robotics. Implementation of the Industry 4.0 concept», Fanuc, Russia
- 14:10 – 14:30 **Prof. D.N. Truschnikov** «Works at the Perm Polytechnic University on the development of equipment and technological solutions for the hybrid additive production of parts for the aerospace industry», Perm National Research Polytechnic University, Russia

### 14:30 – 15:30 Lunch

**15:45 – 17:45** Master class on 3D scanning and modern measurement methods, WCRC «advanced digital technologies», State Marine Technical University, iQB Technologies

**18:00 – 19:00 Dinner**

## September 21, Tuesday

№ п.п	Time	Section № 1 (Conference hall)	Time	Section №2 (Classroom № 16)
		<b>Physical fundamentals and mathematic simulation of beam technologies. CAD-CAM-CAE systems</b>		
1.	10:00 – 10:20	<b>Artinov A.</b> «Mathematical analysis of the bulging effect in high power laser beam welding of thick steel sheets», BAM Federal Institute for Materials Research and Testing, Germany	10:00 – 10:20	
2.	10:20 – 10:40	<b>Ragulin A.E.</b> «CAM system for programming additive & hybrid CNC systems », Delcam-m, Russia	10:20 – 10:40	
3.	10:40 – 11:00	<b>Stankevich S.L.</b> «Investigation of the influence of gas-dynamic parameters on the trajectories of powder particles in a gas-powder jet», SMTU, Russia	10:40 – 11:00	
4.	11:00 – 11:20	<b>Udin I.N.</b> «Development and optimization of the algorithm for calculating the geometry of the deposited layers in the direct laser deposition of multi-pass walls», SMTU, Russia	11:00 – 11:20	
5.	11:20 – 11:40	<b>Frolov K.A.</b> «Investigation of the nature of the distribution of thermal fields under laser action on the surface of aluminum plates oriented at different angles», Vladimir State University, Russia	11:20 – 11:40	
<b>11:40 – 12:00 Coffee - break</b>				

<b>№ п.п</b>	<b>Time</b>	<b>Section № 1 (Conference hall)</b>	<b>Time</b>	<b>Section №2 (Classroom № 16)</b>
		<b>Equipment and technology for additive manufacturing</b>		<b>Equipment and technology of welding, cladding and heat treatment</b>
6.	12:00 – 12:20	<b>Perevozchikov M.V.</b> «Additive Manufacturing, Oerlikon solutions for mechanical engineering», Oerlikon AM, Russia	12:00 – 12:20	<b>Grigorev A.M.</b> , «Laser heating and modification of the structure of transparent materials with a band gap», Laser technology center, Russia
7.	12:20 – 12:40	<b>Aksenov A.G.</b> «Additive manufacturing in UEC-Aviadvigatel», UEC-Aviadvigatel	12:20 – 12:40	<b>Devoino O.G., Kardapolova M.A.</b> , «Laser modification of nickel-and copper-based gas-thermal», Belarusian National Technical University, Belarus
8.	12:40 – 13:00	<b>Soloveva Ya.Yu.</b> «Application of laser growing technology for the creation of ship propulsion systems with reduced vibration activity», The Head Branch "NPO "Vint" of JSC "CS "Zvyozdochka", Russia	12:40 – 13:00	<b>Devoino O.G., Kardapolova M.A.</b> , «Creating a surface layer with a variable set of physical, mechanical and operational properties on cast iron products», Belarusian National Technical University, Belarus
9.	13:00 – 13:20	<b>Polyakov S.A.</b> «Introduction of additive technologies in PJSC «UEC-SATURN»», PJSC «UEC-Saturn», Russia	13:00 – 13:20	<b>Starkov I.N.</b> , «Creation of a universal complex for the use of electron beam technologies (welding, additive growing, surface heat treatment and marking) based on an installation for electron beam welding», JSC «Perm plant «Mashinostroitel», Russia
10.	13:20 – 13:40	<b>Udalov V.M.</b> «Development of additive technologies for manufacturing of hull penetrations made of dissimilar metals», CDB ME «RUBIN», Russia	13:20 – 13:40	<b>Sliva A.P.</b> , «Investigation of the characteristics of the ion current in the plasma over the penetration channel during electron beam welding», The National Research University «Moscow Power Engineering Institute», Russia
<b>13:40-14:40 LUNCH</b>				
		<b>Equipment and technology for additive manufacturing</b>		<b>Equipment and technology of welding, cladding and heat treatment</b>
11.	14:40 – 15:00	<b>Magerramova L.A.</b> , «The use of additive technologies to reduce the weight of the body parts of gas turbine engine gearboxes», FAI «Central Institute of Aviation Motors named after P. I. Baranov», Russia	14:40 – 15:00	<b>Lanev R.A.</b> , «Robotic laser cladding, crankshaft's journal restoration of a gas piston engine», LLC «IRS Laser Technology», Russia

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12.	15:00 – 15:20	<b>Povalyukhin D.V.</b> , «Features of certification of gas turbine engines (GTE) with parts manufactured using additive manufacturing (AM)», FAI «Central Institute of Aviation Motors named after P. I. Baranov», Russia	15:00 – 15:20	<b>Korsmik R.S.</b> , «Formation of solidification cracking during laser treatment of heat-resistant nickel-based alloys», SMTU, Russia
13.	15:20 – 15:40	<b>Klimova-Korsmik O.G.</b> «Peculiarities of dissimilar gradient materials production using direct laser deposition technology», SMTU, Russia	15:20 – 15:40	<b>Gumenyuk A.</b> , «The effect of an AC magnetic field on flow dynamics and filler wire mixing in high power laser hybrid welding», BAM Federal Institute for Materials Research and Testing, Germany
14.	15:40 – 16:00	<b>Dambietz F.M., Dierken R., Hoffmann P.</b> , «Adaptive DED laser system technology for the additive manufacturing of individualized parts using high-performance materials», ERLAS, Germany	15:40 – 16:00	<b>Isakov V.V.</b> , «Technological model of the process of narrow-seam laser welding of a turbine hollow disc», FAI "Central Institute of Aviation Motors named after P.I. Baranova", Russia
15.	16:00 - 16:20	<b>Gushchina M.O.</b> , «Features of the structure and properties control during the process of Ti-6Al-4V direct laser deposition», SMTU, Russia	16:00 - 16:20	<b>Kuryntsev S.V.</b> , «Laser welding of dissimilar materials, techniques and methods», Kazan National Research Technical University named after A.N. Tupolev, Russia
<b>16:20 – 16:40 Coffee - break</b>				
		<b>Equipment and technology for additive manufacturing</b>		<b>Equipment and technology of welding, cladding and heat treatment</b>
16.	16:40 – 17:00	<b>Babkin K.D.</b> «Enhancement of accuracy in laser metal deposition process», SMTU, Russia	16:40 – 17:00	<b>Grezev N.V.</b> , «Technological capabilities of manual laser welding LightWeld1500», IPG Photonics
17.	17:00 – 17:20	<b>Gulov M.A., Shulyatyev V.B.</b> , «Optimization of laser cladding parameters for nickel-based metal powder for creation of a wear- and heat-resistant coating», Khristianovich Institute of Theoretical and Applied Mechanics, Russia	17:00 – 17:20	<b>Vitoshkin I.E.</b> , «Investigation of the effect of the horizontal focus displacement on the formation of a laser welded joint between alloys of the Al-Cu-Li system and pseudo- $\alpha$ Ti», ITAM SB RAS, Russia
18.	17:20 – 17:40	<b>Dubrov A.V.</b> , «Influence of laser exposure parameters on the interlayer porosity of 316L stainless steel samples in the combined technology of laser metal deposition and laser remelting », ILIT RAS – Branch of the FSRC «Crystallography and Photonics» RAS, Russia	17:20 – 17:40	<b>Malikov A.G.</b> , «Research of laser welding of dissimilar aluminum alloys», ITAM SB RAS, Russia

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19.	17:40 – 18:00	<b>Alekseev A.V.</b> , «Nitriding of martensitic steels obtained by direct laser melting in the glow discharge», Russian University of Friendship Peoples, Russia	17:40 – 18:00	
20.	18:00 - 18:20	<b>Kokareva V.V.</b> , «The quality system of additive manufacturing in the manufacture of parts for industrial gas turbine engines», Samara University, Russia	18:00 - 18:20	

**18:30 – 19:30 Dinner**



<b>№ п.п</b>	<b>Time</b>	<b>Section № 1 (Conference hall)</b>	<b>Time</b>	<b>Section №2 (Classroom № 16)</b>
<b>September 22, Wednesday</b>				
		<b>Equipment and technology for additive manufacturing</b>		<b>Equipment and technology of welding, cladding and heat treatment</b>
21.	10:00 – 10:20	<b>Tsvetkova E.V.</b> , «Direct metal deposition of metal-matrix composite materials based on nickel», Russian Peoples' Friendship University, Russia	10:00 – 10:20	<b>Malikov A.G.</b> , «Research of the phase composition and mechanical characteristics of laser welded joints of aluminum-lithium alloys», Khristianovich Institute of Theoretical and Applied Mechanics, Russia
22.	10:20 – 10:40	<b>Travyanov A.Ya.</b> , «Production of SiC-fiber locally reinforced titanium elements of GTE parts using additive technologies », NUST MISIS, Russia	10:20 – 10:40	<b>Kuznetsov M.V.</b> , «Influence of the regimes parameters on the formation of welds at the laser welding steel grade 316L with thickness 10 mm», SMTU, Russia
23.	10:40 – 11:00	<b>Sentyurina Zh.A.</b> , «Challenges, opportunities and development trends in the field of selective laser melting of heat-resistant nickel alloys», JSC «Composite», Russia	10:40 – 11:00	<b>Borodavkina K.T.</b> , «Influence of mechanical inhomogeneity of weld metal on strength of dissimilar welded joints», National Research University «Moscow Power Engineering Institute», Russia
24.	11:00 – 11:20	<b>Bazaleeva K.O.</b> , «Formation of the structure of metals with selective laser melting», Russian Peoples' Friendship University, Russia	11:00 – 11:20	<b>Santalova Yu.V.</b> , «Influence of thermal aging modes on mechanical properties of steel welded joint 03N18K9M5T», National Research University «Moscow Power Engineering Institute», Russia
25.	11:20 – 11:40	<b>Evlashin S.A.</b> , «Gradient soft magnetic materials produced by additive manufacturing from non-magnetic powders», Skolkovo Institute of Science and Technology, Russia	11:20 – 11:40	<b>Mendagaliyev R.</b> , «Structure and properties of cold-resistant steel 09CrNi2MoCu under repeated laser exposure», SMTU, Russia
<b>11:40 – 12:00 Coffee - break</b>				

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		<b>Equipment and technology for additive manufacturing</b>		<b>Metrology, measuring systems and testing</b>
26.	12:00 – 12:20	<b>Golyshev A.A., Orishich A.M.</b> , «Comparative study of the effect of the laser radiation type on the microstructure and mechanical properties of cermet composites formed by the SLM method», Khristianovich Institute of Theoretical and Applied Mechanics, Russia	12:00 – 12:20	<b>Rausch N.</b> «Process monitoring and optimization of high volume 3d printed metal parts», Plasmotechnik GmbH, Austria
27.	12:20 – 12:40	<b>Roslova A.A.</b> «Hybrid technology for manufacturing lightweight products with a cellular structure made of aluminum alloys», PJSC "UEC-Saturn", Russia	12:20 – 12:40	<b>Dubrov A.V.</b> , «The use of coaxial video monitoring data in laser metal deposition for automatic determination of the characteristics of the molten pool and their comparison with the resulting 3D geometry», ILIT RAS – Branch of the FSRC «Crystallography and Photonics» RAS, Russia
28.	12:40 – 13:00	<b>Reshetov B.V.</b> , «Machines and technologies for processing complex parts made of hard-to-work materials and their hardening», LLC «SEMAT», Russia	12:40 – 13:00	<b>Chuprunov N.E.</b> , «Application of industrial X-ray computed tomography for flaw detection of products manufactured using additive technologies», Neva Technology LCC, Russia
29.	13:00 – 13:20	<b>Gudenko A.V.</b> , «Influence of the oscillation frequency on the microstructure and properties of stainless steel 316 during wire-feed electron beam additive manufacturing», The National Research University «Moscow Power Engineering Institute», Russia	13:00 – 13:20	<b>Bagmanov A.M.</b> , «Integration of the technical vision system in automated laser welding systems of long-dimensional structures», Kazan Federal University, Russia
30.	13:20 – 13:40	<b>Gogolukhina M.E.</b> , «Organizational and economic aspects of gas turbine units recovering using additive technologies», SMTU, Russia	13:20 – 13:40	<b>Golubev V.V.</b> , «Prospects for the creation and application of a hardware and software complex for monitoring the inner surfaces of TA pipes using domestic metrological measuring instruments based on laser measuring systems of continuous 3D scanning», АО «НИИПТБ «Онега»

**13:40-14:40 LUNCH**

<b>№ п.п</b>	<b>Time</b>	<b>Section № 1 (Conference hall)</b>	<b>Time</b>	<b>Section №2 (Classroom № 16)</b>
				<b>Metrology, measuring systems and testing</b>
31.	14:40 – 15:00		14:40 – 15:00	<b>Kruppenikov I.V.</b> , «Providing measurements of complex spatial shapes with a 3D scanner to control the geometric parameters of products», iQB Technologies, Russia
32.	15:00 – 15:20		15:00 – 15:20	<b>Gromakova M. D.</b> , «Metrological support in additive technologies», FSUE «NPO «Technomash», Russia
33.	15:20 – 15:40		15:20 – 15:40	<b>Stepanova K.A.</b> , «Experimental testing results of the acoustic emission method application for studying destruction mechanism of metal materials performed by SLM technology», ITMO University, Russia
34.	15:40 – 16:00		15:40 – 16:00	<b>Lebedev D.S.</b> , «Application possibilities of industrial computer X-RAY tomography in additive production», LLC «Melytek», Russia
35.	16:00 - 16:20		16:00 - 16:20	<b>Bondar M.M.</b> , «Complex solutions for ensuring the accuracy of creating ship contractions with laser measurement equipment», Neva Technology LCC, Russia
<b>16:20 – 16:40 Coffee - break</b>				
<b>Poster session 16:40 – 18:00</b>				
<b>Ceremonial dinner 19:00 – 23:00</b>				

## Poster session

1. **Goncharov A.L.**, «Study of the operating modes of the electrostatic lens of the welding electron gun», National Research University «Moscow Power Engineering Institute», Russia
2. **Kharitonov I.A.**, «Investigation of the thermal state of the elements of a technological electron beam gun under long-term operating conditions», National Research University «Moscow Power Engineering Institute», Russia
3. **Rozhkov K.A.**, «Improvement of the method of electronic beam cultivation of metal products», Mashinostroitel Perm Factory, Russia
4. **Voznesenskaya A.A.**, «Evolution of porosity depending on SLM mode and subsequent HIP processing», Vladimir State University, Russia
5. **Avilova E.A.**, «Controlled formation of microstructures by the method of laser-induced deposition from eutectic solvents», ITMO University, Russia
6. **Mukin D.V.**, «Extension of the solution to the problem of unsteady heat transfer for the case of multi-pass walls when calculating quasiperiodic temperature fields in the process of additive manufacturing», SMTU, Russia
7. **Afonin A.V.**, «The technological cycle of producing products such as «turbopump unit» using direct coaxial laser deposition method», JSC «Kompozit», Russia
8. **Zhilyaev P.**, «Atomistic modeling of grain boundary migration in nickel», Skolkovo Institute of Science and Technology, Russia
9. **Oparin E.S.**, «Analysis of the surface of overhanging elements of parts, made by SLM method», Vladimir State University, Russia
10. **Razoschikov A.S.**, «Investigation of the effect of HIP processing on the physical and mechanical characteristics of parts obtained by the SLM method», Vladimir State University, Russia
11. **Zadykyan G.G.**, «Features of the formation of micro - and macrostructure of heat-resistant nickel alloys during laser processing», SMTU, Russia
12. **Silchonok-Zadykyan S.S.**, «Research of the formation of the structure and properties of products in the process of plastic deformation of the iron-based alloy, obtained by the method of direct laser deposition», SMTU, Russia
13. **Somonov V.V.**, «Investigation of the technological possibility of laser hardening of stainless steel 14Cr17Ni2 to a deep depth of the surface», SMTU, Russia
14. **Somonov V.V.**, «Research of trends in the development of laser additive manufacturing in the Russian Federation on the basis of patent information», ITMO University, Russia

15. **Kovchik A.Y.**, «Research of deformation compensation method in laser metal deposition process of 316L stainless steel product», SMTU, Russia
16. **Voropaev A.A.**, «Laser post-processing influence on the formation of the products lateral surface obtained by the method wire arc additive manufacturing (WAAM)», SMTU, Russia
17. **Devoino O.G.**, «Features of the formation of the affected area during scanning treatment with a fiber laser», BNTU, Belarus
18. **Karlagina Yu.Yu.**, «Laser as a tool for formation of antibacterial and biocompatible coatings on the surface of titanium implants», ITMO University, Russia
19. **Egorova A.V.**, «Investigation of the optical properties of monocrystalline silicon with a deposited layer of spherical zinc sulfide nanoparticles», Vladimir State University, Russia
20. **Chernikov A.S.**, «Formation of a layer of spherical zinc sulfide nanoparticles obtained by laser ablation on the surface of a silicon substrate under the action of an electrostatic field», Vladimir State University, Russia
21. **Kochuev D.A.**, «Influence of laser-induced plasma parameters on the formation of laser-induced surface-periodic structures», Vladimir State University, Russia
22. **Khorkov K.S.**, «LIPSS on stainless steel using femtosecond laser radiation processing», Vladimir State University, Russia
23. **Nosyrev N.A.**, «Technology of gas-powder laser cladding of antifriction surface of ship propeller shafts», JSC SSTC, Russia
24. **Larin M.V.**, «Influence of edge preparation quality in laser butt welding of thin parts Ti - 6Al - 4V alloy, produced by selective laser melting», SMTU, Russia
25. **Akhmetov A.D.**, «Hybrid laser-arc and laser welding of tube steels», SMTU, Russia
26. **Voropaev A.A.**, «Laser welding with filler wire in narrow gap», SMTU, Russia
27. **Akhmetov A.D.**, «Defect formation preventing at the overlap zone at the laser welding along a closed trajectory», SMTU, Russia
28. **Panov D.V.**, «Effect of laser polishing on the surface properties of parts manufactured by SLM», Skolkovo Institute of Science and Technology, Russia
29. **Marchenko E.**, «Laser welding of thin wire from nickelide titanium alloy», Томский государственный университет, National Research Tomsk State University, Russia
30. **Platonov A.V.**, «Creating of long spatial wavelengths structures on the surface of Ti-6Al-4V VIA laser structuring by remelting approach», National Research Nuclear University MEPhI, Russia

31. **Kuzminova Yu.**, «In-situ manufacturing of CrFeCoNiAl<sub>x</sub> high-entropy alloy by powder bed fusion technology», Skolkovo Institute of Science and Technology, Russia
32. **Shalnova S.A.**, «Structure and properties of near-alpha titanium products obtained by direct laser deposition», SMTU, Russia
33. **Grigoryev A.G.**, «Application of METACLAY composite tape to the metal surface under conditions of the surface and the composite heated by laser radiation», Laser Technology Centre, Russia
34. **Gusev D.O.**, «Overview of promising methods control of straightness of pipes of lifting and mast devices», «Onegastar», Russia
35. **Stepanov A.N.**, «Analysis of the main methods and methods for monitoring, measuring and determining the technical condition of the inner surfaces of TA pipes», «Onegastar», Russia
36. **Dubin O.N.**, «Direct metal foam printing», Skolkovo Institute of Science and Technology, Russia
37. **Shekin A.S.**, «Surface wettability control by direct nanosecond laser AL<sub>2</sub>O<sub>3</sub> ceramic texturing», National Research Nuclear University MEPhI, Russia
38. **Ishkinyaev E.D.**, «Simulation of laser surface modification of steel by linearly moving and oscillating beam», National Research Nuclear University MEPhI, Russia
39. **Simonov A.**, «Column collapse calibration technique for DEM simulations of metal powders», Skolkovo Institute of Science and Technology, Russia
40. **Pakhomova E.A.**, «Function Representation (FRep) for basic processes modeling in 3D bioprinting», Skolkovo Institute of Science and Technology, Russia
41. **Popov D.**, «Web CAD/CAM system for additive manufacturing based on function representation», Skolkovo Institute of Science and Technology, Russia