

Regional Workshop on New Paradigms of Innovation and

Technology to Address the Challenges of COVID-19 Pandemic

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Role of 4th Industrial Revolution (4IR) Technologies to Drive Inclusive Economic Growth During the Pandemic

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The profit margin be squeezed

Industry	Net Margin	Industry	Net Margin
Aircraft and aerospace equipment	5.6%	Lumber and wood products	3.3%
Apparel	5.4%	Machinery	5.3%
Chemicals	9.6%	Motor vehicles and equipment	nt 2.1%
Drugs	15.5%	Nonferrous metals	5.2%
Electrical machinery	7.0%	Paper	3.4%
Fabricated metals	5.7%	Petroleum	7.4%
Food and tobacco	7.7%	Primary metals	5.0%
Furniture and fixtures	4.9%	Printing	8.5%
Industrial chemicals and synthetics	s 3.8%	Rubber	3.6%
Instruments	4.9%	Textiles	4.2%
Iron and steel	4.8%	Transportation equipment	3.4%



The slowdown in GDP Growth





Note: 2015 data are estimates; 2016–20 data are forecasts. Source: IMF (2016), World Economic Outlook Database, April 2016.



The Slowdown in Population Growth



Data sources: Up to 2015 OurWorldInData series based on UN and HYDE. Projections for 2015 to 2100: UN Population Division (2015) – Medium Variant. The data visualization is taken from OurWorldinData.org. There you find the raw data and more visualizations on this topic. Licensed under CC-BY-SA by the author Max Roser



B. Global GDP growth









D. Economies in recession





The 4th Industrial Revolution Driven by Innovation







The 1st Industrial Revolution: **Steam engines**

Large scale manufacturing

The 2nd Industrial Revolution: The 3rd Industrial Revolution: Industrial automation



The 4th Industrial Revolution

- Industry 4.0 -
- China Manufacturing 2025 _
- Industrial IoT + _
- AI +
- 5G +
- HPC + ...





An Integrated Cyber Physical System for Intelligent Manufacturing



Physical Platform Analytical and Measurement to reveal systems dynamics at various time and length scales, Distrubuted Manufacturing Systems





Simulation Platform

Modularized simulation tools for multiple scale modelling of complex systems with molecular, mesoscopic and continuum dynamics FULLY INTEGRATED Cloud HPC +A1 PLATFORM



Big Data + Al Platform Data and text mining, Machine Learning, seamless data flow of various types between physical and simulation platform and big data analytics tools



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10⁻³

An Integrated Multiple Scale Simulation Platform

Immersed Boundary Method Two-fluid Model Microscopic kinetic models + LBM. Lagrangian-Eulerian-Stochastic Method









Kinetics of signalling and metabolic pathways

Dynamics (MD) and Non-equilibrium MD

Coarse-grained Monte Carlo (MC) and Molecular



Two-fluid Model (SCFT+Reptation) **Stochastic Entanglement Dynamics** Lattice Boltzmann Methods (LBM)





Smooth Particle Hydrodynamics (SPH)

Theoretical approach: SCFT

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Car-Parrinello MD, Quantum MC





"AI+HPC" based CAE Simulation for Large Scale Design Optimizations



客户界面及数据文件系统



任务作业调度及仿真



基于数值仿真的近似模型优化









"AI+HPC+5G" based Digital Twins Technologies for Intelligent Manufacturing









Patrol Robot



Mobile Collaborative Robot





Robotic Welding Workstation

Footwear Adhesive Application Robot

Applications

- Intelligent Industrial Robots
- Intelligent Unmanned Aerial Vehicles (UAV)
- Intelligent Unmanned Ground Vehicles (UGV)





"AI+HPC+5G" based Digital Twins Technologies for Integrated Precision Farming





APRIKNET-4IR as an Integrated Platform for Innovation Collaboration in Asia-Pacific Region



Asia-Pacific Regional Innovation Knowledge Network - 4IR



Cloud Exhibition

Cloud Exhibition

Open Source Projects	more >>	Cloud Exhibition	more >>
Open Harmony	2020-10-20	Daschow Cloud Exhibition	2020-10-25
apollo	2020-10-20	National Supercomputing Center in Wuxi	2020-10-20
DC3	2020-10-20	National Supercomputer Center in Guangzhou	2020-10-20
Point IO	2020-10-20	National Supercomputing Center in Tianjin	2020-10-20



Thanks for your attention!