



2024年第19期总446期

农牧业信息化专题

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▶ 前沿资讯

1 . These Are the Most Expensive Ag Robots You Can Buy Today (这些是你今天能买到的最昂贵的农业机器人)

简介: In November 2023, the fourth edition of the most comprehensive overview of field and harvest robots was completed. Future Farming magazine featured 60 commercially available field and harvest robots for outdoor crop production. Field robots ranging from autonomous tool carriers, weeding and spraying platforms, and autonomous transporters/farmhands to tractor replacing/equivalent power houses. And harvest robots for robotic harvesting of asparagus, sweet potatoes, radishes, strawberries and table grapes.

The catalogue aims to be an indispensable reference for any farmer and crop grower interested in buying, leasing or renting a field or harvest robot today or in the near future. All listings therefore include pricing information and because for every edition of the catalogue pricing details were a requirement, analytics and trends can be determined quite easily. Robots without pricing, or robots that are not available anymore, can still be found on our website in a separate section.

To help farmers choose, three different categories are being distinguished: multipurpose robots, specialized robots and harvest robots for outdoor crops.

Multipurpose field robots are robots that can perform multiple tasks and jobs such as carrying different implements. A total of 37 of the 60 robots in the recent catalogue can be characterized as multipurpose and are thus capable of performing more than a single task or operation. Gross retail prices roughly vary between €14,235 (\$15,000) and €320,000 (\$337,184). The three most expensive multipurpose field robots in the 2023/2024 catalogue are:

1. AgXeed Agbot 5.115T2: €320,000 (\$337,184)
2. Sitia Trektor Maxi: €251,485 (\$265,000)
3. Pixelfarming Robotics Robot One: €249,000 (\$262,371)

If we were to include the multipurpose robots listed in the category 'robots without pricing or not available anymore', then the Raven DOT, later rebranded to Raven OMNiPOWER 3200, would top the chart. The last revealed retail price amounted to \$700,000 (€661,321) with application equipment and \$375,000 (€354,279) for the vehicle itself.

来源: Future Farming; Global Ag Tech Initiative;

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全文链接:

<http://agri.nais.net.cn/file1/M00/03/6E/Csgk0WY5hngASTgCAALefXsAvzo753.pdf>

2 . BioBoosters Accelerator Program Boosts Innovation for Agtech and Bioeconomy Startups (BioBoosters加速器计划促进农业技术和生物经济初创企业的创新)

简介: Startup companies around the world are interested in joining international

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bioeconomy accelerator program BioBoosters. It is launched by Jamk University of Applied Sciences, together with Valtra, AGCO Power, Neste and Innovestor, and is targeted for growth-oriented startups in the fields of bioeconomy and agritech. The program is part of the activities of BioBoosters by Jamk Business Accelerator.

BioBoosters accelerator program connects agritech and bioeconomy startups and growth companies with end users, investors and corporations. The network of partners includes leading corporations, such as Valtra, AGCO Power and Neste, as well as investors who are ready to support the innovations promoted in the accelerator.

Valtra and AGCO Power are part of the US listed company AGCO Corporation, which is one of the world's largest manufacturer of tractors and agricultural machinery. In the soon-to-start programme AGCO power and Valtra want to build partnerships with startup teams developing the agritech industry.

"At Valtra we aim to be at the top of data driven agriculture, because we need to be able to offer new solutions to our clients in this fast-changing world. We are eagerly looking forward to building collaboration with the startups and innovations to be discovered via the accelerator programme, to improve the productivity, effectivity, and sustainability of agriculture with the help of technology," says Managing Director Mikko Lehtinen, Valtra.

BioBoosters accelerator program offers the attendees not only a tailored growth plan, but also access to valuable industrial partnerships, investor contacts and unique testbed environments. Innovestor's Corporate Venturing provides the startups with coaching and investor contacts.

"Innovestor as an early-stage venture capital firm has useful contacts for startups within the industry. The food production value chain is experiencing a great technological leap, which is a great possibility for startups to grow. The BioBoosters program has a significant network of partners, that can offer the attendees unique contacts and coaching," says Matti Härkönen, Partner, Innovestor Corporate Venturing.

The virtual and physical testbed environment of Bioeconomy Campus and partner farms are an important part of the accelerator program, offering bioeconomy and agritech startups a possibility to test and validate new products and services. The program is unique in Finland, offering the startups coaching and mentoring to polish their business model, as well as increase customer understanding and readiness for financing with the help of experienced mentors. The accelerator program connects the bioeconomy and agritech startups efficiently with potential end users, investors and leading corporations.

Call for the accelerator program is open until April 30, 2024

Call for the BioBoosters Accelerator program opened in March 2024, and program kicks off in June 2024. The duration of the program is six months, and participation is possible both virtually and physically at Bioeconomy Campus. This means that the teams can attend the program from anywhere in the world. Attending the program is free of charge and equity free for the startups. Applying closes in April 30, 2024.

"We are very happy to see startups with a lot of potential interested in our program," says Chief Specialist Anniina Lehtomäki of BioBoosters by Jamk. "I'm looking forward to the cooperation and innovativeness of the world's top agritech and bioeconomy startups, the forerunners in sustainable food production, smart farming and data driven agriculture."

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“Bioeconomy and sustainable food production have the greatest potential in slowing down the climate change and promoting carbon sequestration. With the BioBoosters accelerator program, we invite bioeconomy and agritech startups and early-stage growth companies to join us in cooperation to speed up the digital transformation of bioeconomy and food production,” encourages Director Minna Lappalainen, Institute of Bioeconomy, Jamk UAS.

The BioBoosters accelerator program is part of the activities of the BioBoosters by Jamk business accelerator and “Finnish Future Farm”-project, that is funded by the Regional Council of Central Finland. In the “Finnish Future Farm”-project, the aim is to create a physical and virtual bioeconomy and smart farming testbed environment for co-development and knowledge sharing in the Bioeconomy Campus in Saarijärvi, Central Finland. The project is run by Jamk UAS, and partners are Poke Vocational School, Valtra, AGCO Power, Neste and the city of Saarijärvi.

来源: JAMK University; Global Ag Tech Initiative;

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http://agri.nais.net.cn/file1/M00/03/6D/Csgk0WYkk_uAdzYA AJAOUYrp50957.pdf

3 . AI-Driven Climate Insurance: A Provocative Solution to Earth’s Uncertain Future (人工智能驱动的气候保险：应对地球不确定未来的一个积极主动解决方案)

简介: As the world grapples with the existential threat of climate change, traditional solutions seem increasingly inadequate. Rising sea levels, extreme weather events, and ecological disruptions paint a grim picture of our planet’s future. In this turmoil, the marriage of two seemingly disparate entities —Climate Insurance and Generative AI — offers a beacon of hope. Could these innovative approaches pave the way for a more resilient and sustainable world? Let’s dive into the provocative potential of this groundbreaking synergy.

Revolutionizing Risk Assessment

Conventional risk assessment models often fall short of capturing the complexities of climate-related hazards. Enter Generative AI — a disruptive force capable of generating vast arrays of synthetic data. By simulating diverse climate scenarios, this technology empowers insurers to foresee and prepare for the unpredictable. From forecasting floods to predicting wildfire patterns, Generative AI revolutionizes risk assessment, arming insurers with unparalleled insights into the evolving climate landscape.

Empowering Innovation in Insurance

The insurance industry, long shackled by rigid policies and outdated practices, is ripe for disruption. Generative AI unlocks a treasure trove of possibilities, enabling the creation of innovative insurance products tailored to the challenges of climate change. Parametric policies automatically trigger payouts in the wake of predefined climate events, microinsurance schemes for vulnerable communities, and dynamic pricing structures reflecting real-time climate data — all fueled by the transformative potential of AI.

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Amit Pradhan, VP of Strategy at Farmers Edge, expresses that “As we explore the fusion of AI and Climate Insurance, a pragmatic pathway to transformative change emerges. Farmers Edge is actively driving this evolution, partnering with insurers in critical markets such as North America, Brazil, and India. Through our practical approach, we are introducing AI-driven solutions to crop insurance and agricultural lending, enhancing risk assessment and claims management. This adoption of technology has a massive value proposition, from informed decision-making, improving operational efficiency to elevated customer satisfaction.”

Bridging the Gap: Education and Awareness

Yet, the true power of AI-driven climate insurance lies not just in financial instruments but in fostering a culture of resilience. Through interactive educational tools and immersive visualizations, Generative AI brings the reality of climate change to life. From policymakers to the general public, these captivating narratives illuminate the urgency of action and the pivotal role of insurance in building a sustainable future. By bridging the gap between knowledge and action, AI becomes a catalyst for transformative change.

- **Interactive Education Tools:** Generative AI can be leveraged to create interactive educational tools that engage and inform people about the complexities of climate change. These tools can include simulations, games, and virtual experiences that allow users to explore different climate scenarios and understand their potential impacts on communities, ecosystems, and economies. By making learning about climate change interactive and immersive, these tools can capture the attention of a wider audience, including policymakers, educators, and the general public.
- **Immersive Visualizations:** Visualization is a powerful tool for communicating complex ideas and data in an accessible way. Generative AI can be used to create immersive visualizations that depict the effects of climate change in vivid detail, from rising sea levels to changing weather patterns. These visualizations can help people grasp the urgency of the climate crisis and the need for action. By providing a compelling visual representation of the challenges we face, AI-driven visualizations can inspire greater awareness and motivate individuals and communities to take meaningful steps toward resilience.
- **Community Engagement:** AI-driven climate insurance can empower communities to take proactive measures to build resilience and adapt to changing climate conditions. By providing communities with access to information, resources, and support, AI-driven solutions can help them identify and prioritize their most pressing climate risks and develop tailored strategies for mitigation and adaptation. By involving communities in the decision-making process and equipping them with the tools they need to take action, AI-driven climate insurance can foster a sense of ownership and empowerment, strengthening community resilience in the face of climate change.
- **Policy Awareness:** Educating policymakers about the importance of climate insurance and the role of AI in enhancing resilience is crucial for driving policy change and fostering greater investment in climate adaptation and mitigation efforts. Generative AI can be used to create persuasive narratives and compelling arguments that highlight the economic, social, and environmental benefits of investing in climate insurance and

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AI-driven solutions. By raising awareness among policymakers and advocating for policy reforms, AI-driven climate insurance can help create an enabling environment for innovation and collaboration, paving the way for more effective climate action at local, national, and global levels.

In the face of unprecedented environmental challenges, bold and unconventional solutions are imperative. AI-driven climate insurance represents a paradigm shift — a fusion of technology and compassion that transcends traditional boundaries. As we navigate the turbulent waters of climate change, let us embrace the provocative potential of this synergistic approach.

Together, we can forge a path towards resilience, sustainability, and a brighter tomorrow.

来源: IBM; Global Ag Tech Initiative;

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➤ 学术文献

1. 农业知识驱动服务技术革新综述与前沿

简介: 农业知识驱动服务技术是指运用先进信息技术,科学、高效调配农业领域专业知识服务资源,为农业行业提供智能化知识服务的技术,在解决农业技术服务供需严重失衡等难点问题方面具有重要意义,日益成为支撑农业转型升级和高质量发展的重要引擎,代表着核心研究方向,伴随着技术发展全过程。目前农业行业迫切需要解决的是知识供给严重不足、服务效率不高的问题,农业知识驱动服务技术经历较长时间发展,在知识高效匹配和精准供给方面取得了较大进步,特别是2022年11月以来ChatGPT这类技术的出现,充分展现了超大规模预训练模型在知识智能服务方面的巨大潜力,这也是农业知识驱动服务可以取得突破的关键所在,可以在这方面发挥重要作用。该文在分析农业知识驱动服务相关技术现状的基础上,展望了农业领域可行的知识驱动服务技术路径,预测农业领域知识服务大模型研发构建会呈现参数由少到多、算力由弱趋强、强化训练逐渐加深的特点得到快速发展应用,未来将在专业技术指导、农业“装备-信息-农艺”融合、农业信息系统平台服务总线等方面系统升级现有农业知识服务范式,多模态服务将得到系统融合加深,人机交互模式将向“人性化”方向进一步黏合增强,从而为农业智能化转型升级提供全新的技术支撑,引领农业知识服务从数据检索、语义匹配迈向生成式知识驱动模式转变。

来源: 农业工程学报;

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<http://agri.nais.net.cn/file1/M00/03/6E/Csgk0WY5hQuAbr3yABtJ8iTGJSs543.pdf>

2. 果园智能化作业装备自主导航技术研究进展

简介: 果园生产管理主要包括喷药、施肥、割草、修剪、授粉、疏花和采收分级等作业环节,需要大量的人力投入,随着我国人口老龄化程度加剧,亟需果园生产管理由机械

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化向智能化转型升级。自主导航技术是果园机械化装备实现智能化的关键技术。本文围绕果园智能化作业装备导航控制需求,结合国内外研究现状,分别阐述了包含导航定位信息和障碍物信息的果园作业场景感知技术,导航地图构建、导航路径提取和路径规划技术,行走底盘运动学模型构建、运动控制技术,多机协同控制、远程交互控制技术等。随着智慧农业发展,智慧果园已成为果园未来发展方向,果园智能化作业装备是智慧果园建设必不可少的关键环节,在此基础上,归纳了我国果园智能化作业装备自主导航技术发展面临的问题为:环境感知能力不足、路径提取不稳定、局部路径规划不灵活、导航系统环境适应性欠缺、多机协同和远程控制不成熟等,提出了多传感器融合的环境感知与路径提取、完整路径规划、强通用性果园导航、大型果园多作业环节的多机协同与远程操作等未来发展方向。

来源: 农业机械学报

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3. 退化草地改良工艺与装备发展综述

简介: 中国有90%以上的草地处于退化或正在退化状态,严重影响畜牧业和生态环境的可持续发展,退化草地改良十分关键。目前,草地改良技术相关科学研究、草地改良生产实践、草地改良机械研发等存在一定的脱节现象,限制了中国草地改良的整体推进。针对以上问题,该研究对24种目前常见的草地改良技术进行总结,归纳了改良技术特点及适用条件。对草地改良技术进行系统分析,建立草地改良技术分类框架,形成草地综合改良工艺流程。在所建立的4类草地改良原理框架下,分析了相应改良技术作业工艺及相关作业机械的特点,并指出相关作业机械和设备的研发方向。基于目前草地退化还未彻底遏制的现状,未来草地保护和退化草地的机械化改良应重点开展以下工作:1) 加强草地保护,增加草地退化预防环节,坚持走用草养地相结合的道路。2) 草地改良工艺方面,在现有免耕直播改良工艺基础上重组和优化改良工艺,研发和推广复式改良机械。3) 在草地机械化改良技术方面,应强化基础研究,弥补现有改良机械的技术短板,充分发挥特色技术优势。4) 在草地保护和改良政策方面,应加强政策支持和对基层的技术指导,提高基层对草地保护和草地改良的积极性。该研究可为退化草地改良工艺方案制定、相关作业机械选择、相关政策制定等提供参考,为草地改良机械设备的研发提供借鉴。

来源: 农业工程学报;

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