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2025

学科前沿快报

Aademic Frontier Bulletin

2025年第02期（总第64期）

图书馆信息部

学科前沿快报 2025 年第 02 期（总第 64 期）

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本刊网址：https://lib.sdtbu.edu.cn/info/1044/2557.htm

学术情报纵览

《全球工程前沿2024》报告

以下文章转载于“科睿唯安”微信公众号。

科睿唯安、中国工程院、高等教育出版社于2024年12月18日联合发布《全球工程前沿2024》报告。这是三方连续第八年发布“工程前沿”系列报告，遴选工程科技关键研究方向，前瞻把握世界科技发展动向。

报告依托中国工程院9个学部，围绕机械与运载工程、信息与电子工程、化工冶金与材料工程、能源与矿业工程、土木水利与建筑工程、环境与轻纺工程、农业、医药卫生、工程管理9个领域，遴选出92项全球工程研究前沿和92项全球工程开发前沿。

工程前沿分为侧重理论探索的工程研究前沿和侧重实践应用的工程开发前沿。工程研究前沿的遴选包括两种途径：一是基于科睿唯安 Web of Science 数据库论文数据，经数据挖掘聚类形成工程研究前沿主题；二是通过专家提名，提出工程研究前沿问题。工程开发前沿的遴选同样包括两种途径：一是基于科睿唯安 Derwent Innovation 专利检索平台，对各学科组的高影响力专利家族进行文本聚类，获得专利地图，领域专家从专利地图中解读出备选工程开发前沿；二是通过专家提名，提出工程开发前沿问题。

《全球工程前沿2024》
中文报告下载

原文链接：https://mp.weixin.qq.com/s/vRNSpVQGh9ga9NeBl-fMSQ

科睿唯安宣布一项变革性战略，对面向学术界的文献资源订阅方案进行调整

以下文章转载于“科睿唯安”微信公众号。

英国伦敦，2025年2月18日——科睿唯安宣布一项新的文献资源订阅战略。新战略为用户广泛且经济地获取电子书和数字化一次文献高质量学术资源扫除了障碍，帮助图书馆更好地支持研究、教学和学习目标。

近年来，研究机构采购图书、期刊和其他学术文献的模式开始改变，这种改变在新冠疫情之后更加明显。图书馆面临日益复杂的购买模式，这些模式无法满足课程和研究所需的文献内容。而能以可持续方式提供经济的解决方案，正持续受到图书馆的青睐。

与此同时，人工智能（AI）驱动的聊天机器人正变得无处不在，成为学生和研究人员的一种新型学术探索工具。学术AI工具提供可靠输出的能力，取决于他们是否能获取广泛且经过详细审阅的学术文献内容。

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涵盖广泛，跨学科：订阅文献内容涵盖9个ProQuest One学科解决方案，包括人类学、娱乐与流行文化、全球研究与国际关系、历史、文学、表演艺术、视觉艺术与设计。

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为了满足图书馆的需求变化，作为战略变革的一部分，科睿唯安还将逐步停止图书馆以一次性买断方式采购ProQuest数字化的文献资源、纸本及电子书业务。我们将与客户密切合作，在2025年进行该业务转型。更多详情请点击文末阅读原文参阅我们的支持页面。

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原文链接：https://mp.weixin.qq.com/s/E-vTXz01DGe2UOKXGA7pBg

优秀文献荐读

管理科学与工程

题　　名：基于引力模型的潜在跨学科知识组合发现研究

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发文时间：2025.01.22

摘　　要：新文科建设提倡学科间的交叉融合。在此背景下，分析跨学科知识之间的吸引力和发现高潜力的跨学科知识组合对于指导跨学科创新方向、促进学科间的交叉融合、推动学科转型都具有重要意义。以我国 6 种图书情报学科期刊和 6 种管理学科期刊 2021 年发表的文献全文为研究对象，展开实证分析。通过引入物理学中的万有引力模型，从引文内容出发寻找和量化跨学科知识点之间的吸引力，进而为潜在跨学科知识组合热点的预测，以及过往被忽视跨学科知识组合的再发现提供帮助。研究结果表明模型能够很好地量化学科知识点之间的跨学科引力，并具有较好的可行性和有效性。此外，通过综合分析发现，图书情报领域研究能为管理学研究提供更多数据分析和知识组织方法以及工具，过往图书情报学科中关于突发事件、情感分析的研究与管理学科中企业创新和绩效提升相结合的过程未被重视，未来或许能为企业创新产品在突发事件处置上应用的扩展，以及产品优化、口碑建设、企业管理打开新思路。

关 键 词：跨学科；知识组合；引文内容；引力模型；图书情报；管理学

原文出处：数字图书馆论坛

文章链接：

https://kns.cnki.net/kcms2/article/abstract?v=YHRUfPYi6NOdRK9ZHO7QXi4XWvgvCs3As2TVDdnRiL-A_TYkIapE-K2c5_VQAMNY_9Je1OHLDmPz3JgiRjJwWDoTr6sOnjQ1HYrEpf7310X3e9VnPpM759IdpViAnqszD8609X7HcN_if7zv_Fp0l21OI_XXiRHInAbqcnFcU0DPa5tA1WVzVJzR1JwiIu0n&uniplatform=NZKPT

题　　名：管理语言学视角下的“管理+语言”研究：演进、评述与展望

作　　者：杨 丹[1]，李 倩[1]，李思飞[1]，龚诗阳[2]
机　　构：1.北京外国语大学国际商学院，2.北京师范大学经济与工商管理学院
发文时间：2025.01.15
摘　　要：随着大语言模型的快速发展，语言学理论与技术不断赋能管理学研究。本研究系统地梳理和评述了这一跨学科研究领域。首先，基于相关文献和理论溯源，提出“管理+语言”研究分析框架。基于该框架，本文使用文献计量分析方法，收集来自39种国内外管理学领域权威期刊上的1246篇文献数据并进行文献计量分析。基于分析结果，勾勒出“管理+语言”研究的发展历程，即探索（1999年之前）、融合（2000-2009年）和多元化（2010年至今）三个关键阶段。继而，从财务会计、市场营销、组织人力和战略管理这四个细分领域，总结了“管理+语言”研究的主要进展。最后，对管理语言学研究的未来趋势和待解决问题进行了展望，并就在中国背景下深化“管理+语言”研究提出了思考和建议。
关 键 词：管理学；语言学；研究评述；文献计量；管理语言学
原文出处：中国管理科学.2025,33(01)
文章链接：
https://kns.cnki.net/kcms2/article/abstract?v=YHRUfPYi6NNAkyObjtYf1-pA1-dFq37zcmPGW--SVNeF19OFuUBySBMdeyPIl-fj40QKyu373YYIczVnSiRxwS8uzxl8Z-coK7giqD2WfVlLIH6Q3vLXJb4MXV9LzFwXu3-VAw2OVYm_2Ln9MYbDpyhKMzg-XxmasJ76Gx8kzn_rWBKdpfHR8bAQJGPikfPY&uniplatform=NZKPT

题　　名：新质生产力的管理学本质与分析框架

作　　者：黄速建
机　　构：中国社会科学院工业经济研究所
发文时间：2024.12.26
摘　　要：在由技术革命性突破引发的数字化、智能化工业革命背景下，新质生产力成为推动经济高质量发展的关键动力。发展新质生产力不仅是中国经济从高速度发展向高质量发展的必然选择，也是实现中国式现代化、提升中国在国际竞争格局中地位的战略要求。企业是新质生产力的载体和关键主体。新质生产力的管理学本质是企业敏锐感知与迅速应对外部制度、技术和市场变化，抓住机会，有效整合、构建和重新配置内外部资源，革新企业战略，用更适应环境和效率更

高的动态能力替代原有动态能力，以获得并保持持续竞争优势。创新在新质生产力形成和发展过程中的重要性远超前几次工业革命，是推动企业资源更新配置、形成动态能力的核心驱动力，贯穿于新质生产力形成与发展的全过程。可按新质生产力的管理学本质构建“环境-制度-资源”的基本分析框架，分析对新质生产力发展有着重大影响的关键因素。

关 键 词：新质生产力；管理学本质；环境基础；制度基础；资源基础

原文出处：山东师范大学学报(社会科学版).2025,70(01)

文章链接：

https://kns.cnki.net/kcms2/article/abstract?v=YHRUfPYi6NNwDSZTfHmZNWmCQqsYPmfQx77PQNfRqbKF8NUYrJgR2hH3-3PW3zxZzi49_bMO4vOsGP9Ypq43qvIh6R5u8zS9GT3wrKs5Cvc-Lh3rZwjCseF6EAFK6iYt9r-oQSR3w7TbOwJZfRWLu4Uh9MppA0mGgTBXofUq0OaBQvVH91Y45PBCW3lFQVZk&uniplatform=NZKPT

Title:

Does bricolage serve as a path to disruptive innovation for SMEs in dynamic environments? The contradictory roles of managerial ties

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Indicator:

Published in 2025

Abstract:

Existing literature does not adequately explain how and under what conditions environmental dynamism facilitates small and medium-sized enterprises' (SMEs) disruptive innovation when faced with resource-constraints. To fill this gap, this study constructs a research model based on resource dependence theory and empirically tests the impact of market and technological dynamism on disruptive innovation, as

well as the mediating role of bricolage and the moderating effect of managerial ties, using data from a sample of 338 Chinese SMEs. Additionally, we conduct qualitative research based on semi-structured interviews to further validate the moderating effect of managerial ties. The analysis results show that: (1) while both market and technological dynamism are conducive to disruptive innovation, market dynamism has a greater positive impact; (2) bricolage partially mediates the impact of market dynamism on disruptive innovation and fully mediates the impact of technological dynamism on disruptive innovation; (3) political ties reduce the impact of market dynamism on bricolage while increasing the impact of technological dynamism; and (4) business ties increase the impact of market dynamism on bricolage while decreasing the impact of technological dynamism.

Keywords:

Disruptive innovation; Environmental dynamism; Bricolage; Managerial ties; Emerging economies

Source:

Industrial Marketing Management

Volume 125, February 2025, Pages 386-399

Link:

https://www.sciencedirect.com/science/article/pii/S001985012500015X

Title:

JAQ of all trades: Job mismatch, firm productivity and managerial quality

Author:

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Indicator:

Published in 2025

Abstract:

We develop a novel measure of job-worker allocation quality (JAQ) by exploiting employer-employee data with machine learning techniques. Based on our measure, the quality of job-worker matching correlates positively with individual labor earnings and firm productivity, as well as with market competition, non-family firm status, and employees' human capital. Management plays a key role in job-worker matching: when managerial hirings and firings persistently raise management quality, the matching of rank-and-file workers to their jobs improves. JAQ can be constructed from any employer–employee data set including workers' occupations, and used to explore research questions in corporate finance and organization economics.

Keywords:

Jobs; Workers; Matching; Mismatch; Machine learning; Productivity; Management

Source:

Journal of Financial Economics

Volume 164, February 2025, 103992

Link:

https://www.sciencedirect.com/science/article/pii/S0304405X24002150

Title:

Design flexibility in managing infrastructure projects: Contributing factors and research avenues

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Indicator:

Published in 2025

Abstract:

Managing infrastructure projects often presents challenges in maintaining flexibility

throughout their lifecycle, which limits their ability to adapt to evolving and uncertain conditions. This systematic literature review examines the factors that accelerate design flexibility in the management of infrastructure projects. Analyzing 50 articles from a dataset of 11,443, we identified several key factors, organized into seven clusters across three levels: individuals, organizations, and inter-organizational relationships and three operational dimensions of design flexibility. These factors help to expand the concept of flexibility beyond its traditional association with engineering product design to encompass managerial project design. Building on Simon's design theory, this study frames design flexibility as a proactive and strategic asset. We offer future research directions to further broaden the scope of flexibility in project management. This study contributes to ongoing debates in project management on how to enhance project performance in uncertain conditions, by addressing the challenge of balancing flexibility and control.

Keywords:

Design flexibility; Construction; Uncertainty; Risk; Project management; Decision-making

Source:

International Journal of Project Management

Volume 43, Issue 1, January 2025, 102675

Link:

https://www.sciencedirect.com/science/article/pii/S026378632500002X

计算机科学与技术

题　　名：基于有向超图自适应卷积的链接预测模型

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机　　构：1.苏州大学计算机科学与技术学院，2.江苏省计算机信息处理技术重点实验室(苏州大学)

发文时间：2025.02.05

摘　　要：图神经网络（GNN）为链接预测提供了多样化的解决方案，但由于普通图的结构限制，目前的相关模型在充分利用顶点间的高阶及不对称信息方面存在明显的不足。针对以上问题，提出一种基于有向超图自适应卷积的链接预测模

型。首先，使用有向超图结构更充分地表示顶点间的高阶和方向信息，兼具超图和有向图的优势；其次，有向超图自适应卷积采用自适应信息传播方式替代传统有向超图中的定向信息传播方式，从而解决了有向超边尾部顶点不能有效更新嵌入的问题，同时解决多层卷积导致的顶点过度平滑问题。在 Citeseer 数据集上基于显式顶点特征的实验结果显示，在链接预测任务上，相较于有向超图神经网络（DHNN）模型，所提模型的 ROC (Receiver Operating Characteristic)曲线下面积（AUC）指标提升了 2.23 个百分点，平均精度（AP）提升了 1.31 个百分点。因此，所提模型可以充分表达顶点间的关系，并有效提高链接预测任务的性能。

关 键 词： 图神经网络；有向超图；链接预测；超图卷积；表示学习；自适应卷积

原文出处： 计算机应用.2025,45(01)

文章链接：

https://kns.cnki.net/kcms2/article/abstract?v=i_LPdPvRpB6T_5nffHNpIYHNuGXM8TTh6WRiHak-fhq-H3uRNan7ANpu1LqF8eUYu8LyYju-5gOUf_1SVag84aTL8vHgBImwt5Sb3ktf9lqZyo6jntGodEJAfN7t1exHMQYotSkgUA-JpBIs74s-d5e6w5fe774LYGomVbCgGUWobodeLDFpF8x0kpWuYCFr&uniplatform=NZKPT

题　　名： 强化学习和矩阵补全引导的多目标试卷生成

作　　者： 邢长征[1]，梁浚锋[1]，金海波[1]，徐佳玉[1]，乌海荣[2]

机　　构： 1.辽宁工程技术大学电子与信息工程学院，2.阜新市大数据管理中心

发文时间： 2025.02.05

摘　　要： 针对现有的试卷生成技术存在过多关注生成试卷的难易程度，而忽略了其他相关目标，例如质量、分数分布和技能覆盖范围的问题，提出一种强化学习和矩阵补全引导的多目标试卷生成方法，以优化试卷生成领域的特定目标。首先，运用深度知识追踪方法对学生之间的交互信息和响应日志进行建模以获取学生群体的技能熟练程度；其次，运用矩阵分解和矩阵补全方法对学生未做的习题进行得分预测；最后，基于多目标试卷生成策略，为提升 Q 网络的更新效率，设计一个 Exam Q-Network 函数逼近器以自动地选择合适的问题集来更新试卷组成。实验结果表明，相较于 DEGA (Diseased-Enhanced Genetic Algorithm)、SSA-GA (Sparrow Search Algorithm-Genetic Algorithm)等模型，在试卷难度、合理性、准确性这 3 个指标上验证了所提模型在解决试卷生成场景的多重困境方面上效果显著。

关 键 词：多目标试卷生成；深度知识追踪；Q 网络；矩阵分解；矩阵补全
原文出处：计算机应用.2025,45(01)
文章链接：
https://kns.cnki.net/kcms2/article/abstract?v=i_LPdPvRpB5JxJsdPx9vQaMXKtP6HJQPqomd41o8pqwEZWNAAZlQYlPLVZR-aD7biceYS4CPgkofsj-PpYk-VscfeIyxahegpQPv-nNarOz1Dy9J5T5F-V1VFuDy2oY0IbXbfKT6Fm39AkGqZO1wfYS3oVeNurg7JPiRAupUaR5qqoLcjbT3jZbFuCg3qQfu&uniplatform=NZKPT

题　　名：基于多视观测优化的无人机运动目标测速方法研究

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发文时间：2025.01.26

摘　　要：测量运动目标的位置和速度是无人机视频分析的重要需求。提出一种基于图像多视观测最小二乘优化的运动目标定位测速算法：利用机载光电系统获取的视频及相应的位姿参数建立多个观测时刻的视线模型，通过坐标变换统一到 WGS-84 坐标系，基于最小二乘算法估计运动目标的位置和速度。该算法无需无人机与目标之间的激光测距信息，也不需要地形高程信息，是一种隐蔽性强的无源定位和测速算法。为了考察该算法的精度和应用条件，在实验部分模拟了 3 种无人机测速场景，考虑了实际测量过程中的多种误差源，利用蒙特卡罗模拟法进行了仿真实验。结果表明：该算法能够快速准确地估计目标的位置和速度，在典型应用场景中定位精度达到 1.5 m、测速精度达到 0.2 m/s，可以满足情报分析的准确性和可靠性要求。

关 键 词：侦察无人机；无源定位；测速；多视观测；蒙特卡罗法
原文出处：系统仿真学报.2025,37(01)
文章链接：
https://kns.cnki.net/kcms2/article/abstract?v=i_LPdPvRpB5nlWcFAwp9CmaR4A5o6-P0SgBWhMH8_nRCVYHRkaqC9n0c4E7qqFwnLEkdFGyL1QFbF4-lLM2sELWLfWu08bhzyWAqksuGcmia4vAOu8ER9-Teid0LGrZI71jThkwsLyeDS81UuhqmDR5rmQcOn1IrKBFsBRR3JzCYL8wT6lsYnqWwr_tMWTsf&uniplatform=NZKPT

Title:

Evaluation of Multispectral Imaging for Freeze Damage Assessment in Strawberries Using AI-based Computer Vision Technology

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Indicator:

Published in 2025

Abstract:

Climate change has increased the propensity for sudden temperature drops in early fall and late spring, resulting in greater chances for frost damage to agricultural crops and fruits. The development of frost-tolerant crops necessitates the application of AI and computer vision technologies to make genetic studies of freezing damage consistent and less error prone. To advance the field, this study explored both feature engineering (feature extraction and feature selection) and deep learning (DL) approaches for frost damage classification. Feature engineering extracted various vegetative indices, while deep learning models, such as CNNs, automatically learned features from multispectral (RGNIR) images. Both machine learning (ML) and deep learning models were trained, validated, and tested on a dataset of RGNIR images acquired from strawberry plants cultivated in a greenhouse setting. For machine learning (ML) models, 70% of the 493 images were used for training and 30% for testing. For deep learning (DL) models, the data was divided into training, validation, and testing sets using a 70:15:15 ratio. Vegetative indices feature such as MCARI, MTVI, and NDVI play significant role in frost damage classification in strawberry. SVM with backward feature elimination (F1-score: 87%) outperformed other machine learning algorithms, including GB, XGB, and RF. Among deep learning models, DenseNet-169 achieved the highest F1-score of 93%, surpassing DenseNet-121, DenseNet-201, Xception, Inception-ResNet-v2, Inception-v3, Spatial Attention, Channel Attention, and Spatial-Channel Attention. Studies shows that the integration

of RGNIR images with computer vision and AI algorithms can be proven effective in classifying frost damage.

Keywords:

Computer vision; Deep Learning; NDVI, Frost damage; Machine Learning

Source:

Smart Agricultural Technology

Available online 21 February 2025, 100851

Link:

https://www.sciencedirect.com/science/article/pii/S277237552500084X

Title:

An efficient object detection mechanism with LSTM-based object recognition for computer night vision images in edge and cloud environments

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Indicator:

Published in 2025

Abstract:

Object detection is the critical part for system considering the surveillances, images and so on. Traditionally, the object detection is being helped to identify the objects present in the source to get the related information and used for various applications. Nevertheless, the earlier detection models are focused on images with normal illumination level, when object detection in low illumination images is quite ignored. Object detection in images with high illumination is a simple task, and most of the research is also done in that field. However, identifying and locating the objects in night vision or images with low illumination is complex. Due to the advancement, the deep learning method is emerging in imaging technology and application. Yet, it hinders to achieve the same performance while detecting the night vision images due

to bad light and low illumination condition. Therefore, a new night vision object detection system is executed in this work. To initiate this work, the mandatory images for conducting the research are gathered from the benchmark dataset. After that, the gathered images are enhanced by the multi-scale retinex network. These enhanced images are given to the object detection phase. Here, the object detection is carried out by the invented 3D Swin Transformer-based Yolov7 structure and the recognition is done using the Long Short-Term Memory (LSTM) approach. Lastly, the outcome achieved from the 3D Swin Transformer-based Deep Learning for Object Detection and Recognition Network (3DST-DL-ODRNet) is correlated with the classical object detection and the recognition system to verify the efficacy of the proposed model. Finally, the proposed system is examined with various measures for detection as well as recognition. Also to ensure the efficiency, the proposed framework is to be compared with classical approaches. On the analysis, the high value of IoU and mAP is achieved as 0.99 and 94.03 for dataset 1, whereas 0.96 and 94.77 for dataset 2. Similarly, in order to recognize the objects, the high accuracy value is obtained as 94.13 and 94.09 for dataset 1 and 2, respectively. Hence, through the experimental results, the suggested model is appropriately performed the object detection and recognition of night vision images.

Keywords:

Object detection and recognition; Computer night vision; Edge and cloud environment; Multi-scale retinex; 3D swin transformer-based deep learning for object detection and recognition network; Long short-term memory

Source:

Applied Soft Computing

Volume 169, January 2025, 112597

Link:

https://www.sciencedirect.com/science/article/pii/S1568494624013711

Title:

Improving hybrid brainstorming outcomes with computer-supported scaffolds: Prompts and cognitive group awareness

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Indicator:

Published in 2025

Abstract:

Guided by the dual pathways to creativity model (DPCM), this study explores how two computer-supported scaffolds — prompts and cognitive group awareness — can enhance the quality of ideas generated in hybrid brainstorming sessions that combine individual and group brainstorming. While prior research has employed these scaffolds to improve group work focusing on convergent thinking in CSCL settings, their application to stimulate divergent thinking in brainstorming sessions remains unexplored. To address this gap, 94 higher education students were randomly assigned into triads and tasked with generating business ideas addressing sustainability issues under three different conditions. In control condition, students generated ideas in a hybrid brainstorming session following an individual-group-individual sequence without any additional support. In experimental 1 condition (prompts), students followed the same sequence but received prompts during the first individual phase, encouraging the use of SCAMPER principles to enhance cognitive persistence. In experimental 2 condition (prompts + cognitive group awareness), students received the same prompts during the individual phases and additional support during the group phase, aimed at enhancing cognitive group awareness through the sharing of individually generated ideas to increase cognitive flexibility. To evaluate the impact of providing prompts, the outcomes of the first individual phase across all three conditions were compared, revealing that students in both experimental conditions generated ideas with significantly higher originality compared to those in control condition. To assess the influence of fostering cognitive group awareness, the outcomes of experimental 1 and 2 conditions were compared. Students in experimental 2 condition showed superior idea quality in both the group and final

individual phases, as evidenced by higher originality, outperforming experimental 1 condition. Furthermore, the findings revealed that flexibility mediated the relationship between cognitive group awareness and idea originality, while also suggesting that originality can emerge through alternative pathways beyond those proposed by the DPCM.

Keywords:

Hybrid brainstorming; Computer-supported scaffolds; Prompts; Cognitive group awareness; SCAMPER principles; Idea quality

Source:

Computers & Education

Volume 227, April 2025, 105229

Link:

https://www.sciencedirect.com/science/article/pii/S0360131524002434

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