



Welcome to our latest edition of the CDE Research Newsletter!

This issue covers a topic that has impacted every facet of society: artificial intelligence. Therefore, it's apt that we title this release: AI+X.

We have an exciting line-up for everyone. Key topics include:

- ♦ Addressing data privacy concerns amongst transportation stakeholders in the increasingly connected travel ecosystem.
- ♦ Boosting predictive preparedness against ground sinking, a continuing environmental challenge.
- ♦ AI-enabled microrobots that navigate challenging terrain, just like the way our own cells handle it!
- ♦ Powerful frameworks to help global AI researchers know when to trust or let go of historical data.
- ♦ A smart thermostat that personalises comfort, which will be critical towards supporting health amidst climate evolution.

Plus, a spectrum of additional exciting and impactful drivers of AI innovation!

It is clear that new advancements in AI are impacting all aspects of the world, from the environment and transportation to wellbeing, micro/nanotechnology, and beyond.

Our researchers represent the very best in our core ethos of bridging first-in-kind innovation with implementation and adoption.

As always, we're grateful for your interest in innovation at CDE. Enjoy the issue!

Dean Ho
Editor-in-Chief



What makes a city comfortable? A new AI-powered index offers clues

A multidimensional AI-driven model uncovers what conventional liveability rankings often overlook.

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Modelling personal comfort: a smart thermostat that learns what temperature you like

ComfortGPT uses generative pre-trained models and a transformer architecture to predict individual thermostat preferences over time.

[Read more >](#)



A new recipe for modelling chemical processes

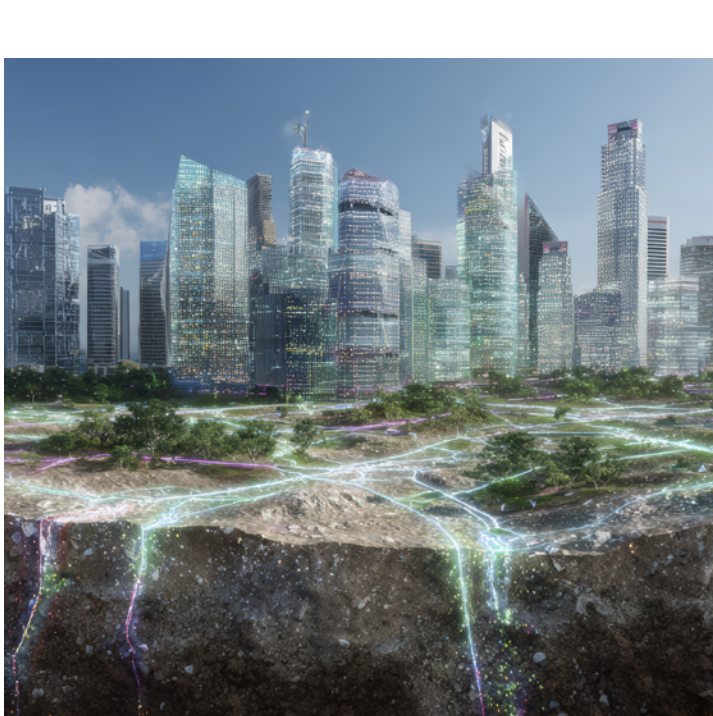
A machine-learning framework helps engineers build models for new chemical processes by combining knowledge from existing ones.

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Safeguarding data privacy on the road

A new model based on federated learning supports data collaboration between traffic authorities and mobility forms — without compromising privacy.

[Read more >](#)



How to train your machine (to understand how the ground behaves)

A neural network meets century-old soil theory — and learns to predict what happens when the ground starts to sink.

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Show-o, don't tell: new unified AI model does it all

A compact AI model understands images/videos, generates visuals and weaves language all within a single framework.

[Read more >](#)



Tracing the family tree of AI models

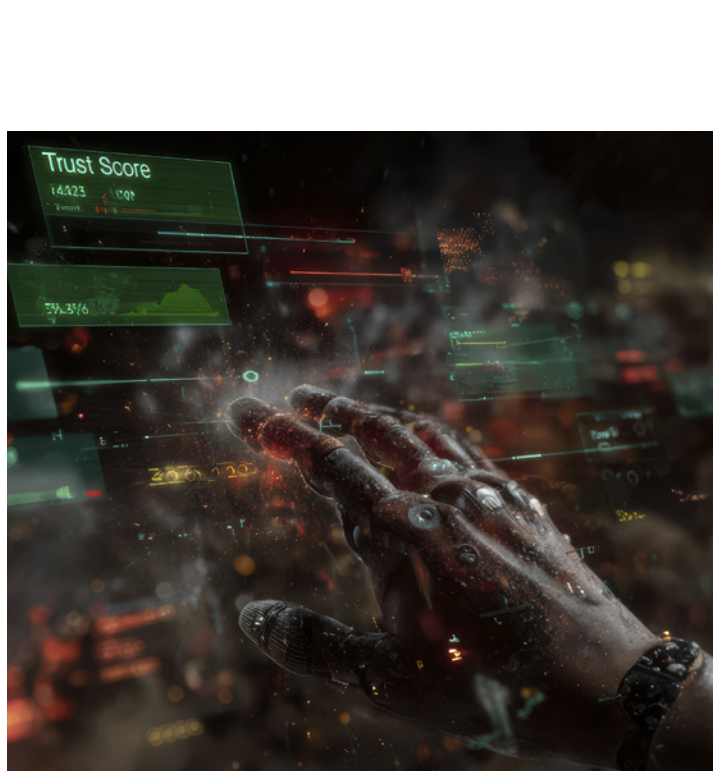
Biology inspires a method to map the ancestry of AI models — and what we inherit may matter more than we think.

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Trust, but verify: a new framework for smarter decision-making

Historical data can guide or mislead. A new theoretical framework shows how to lean on it, and when to walk away.

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AI turns the tide on greenwashing

The A3CG framework helps separate fact from fiction, training AI to cut through vague corporate lingo and spot greenwashing camouflaged in polished sustainability claims.

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The AI swimming academy for miniature robots

Powered by artificial intelligence, tiny robotic swimmers traverse tricky terrain by mimicking how human cells find their way.

[Read more >](#)

