

Publication: Brainstorm

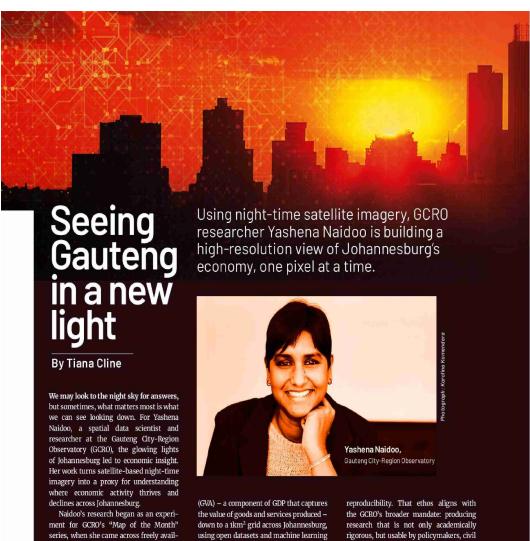
Title: Seeing Gauteng in a new light

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Author: Tiana Cline



(GVA) – a component of GDP that captures the value of goods and services produced – down to a lkm² grid across Johannesburg, using open datasets and machine learning (NL). She trained a Random Forest model (a common ML algorithm that combines the output of decision trees to reach a result) with satellite night-light data, population estimates and existing economic figures from the CSIR to build a time-series model of economic activity from 2011 to 2021.

One of Naidoo's main goals was to make the method replicable. "I really want this to work because if I can get it right using open data, someone else can take it in their context and replicate it," she says. Naidoo's commitment to open access means she deliberately avoids proprietary tools, favouring transparency and

rigorous, but usable by policymakers, civil society and planners. The model builds on earlier work done with the City of Johannesburg and extends GVA projections beyond 2016 using publicly available nightlight data from visible infrared imaging radiometer suite (VIIRS) sensors and LandScan population database estimates While GVA is traditionally mapped only to the CSIR's mesozone layer - demarcated zones in which socioeconomic data can be analysed - Naidoo's model breaks that down to ward level and year-on-year resolution. This enables trend analysis at a much finer scale than standard national statistics allow.

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activity.

able satellite data to visualise light inten-

sity across Gauteng. "The lights are all

artificial, and they represent where we

are," she says, or, put another way, the lights are a proxy for human and economic

Access to fine-grained, high-resolution

economic data in South Africa is scarce.

Official data sources like GDP are often

locked at municipal or provincial levels, with little granularity for planners trying to understand what is actually happening

on the ground. Naidoo, whose background

is in geoinformatics, wanted to change

that. Her work models Gross Value Added



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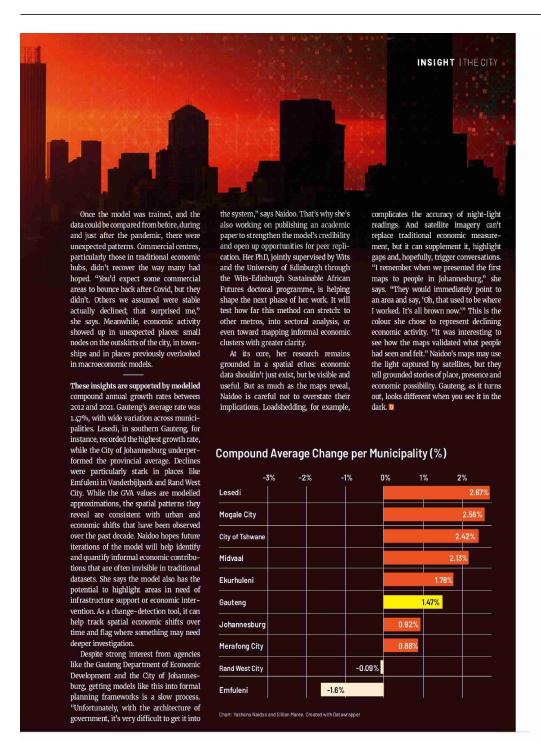
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