

User Mobility Synthesis based on Generative Adversarial Networks: A Survey

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Abstract— User mobility characteristics are considered to significantly affect the performance and UX of modern IT systems such as mobile communications, context-aware services, locationbased applications, smart mobility, and so on. Due to privacy concerns, legal issues, and expensive measurement costs for real user mobility traces, synthetic mobility traces are widely used for research and development purposes. Until now, most of the user mobility synthesis approaches have been categorized into two major paradigms: stochastic modeling and simulation. However, they naturally have a limitation in mimicking actual user movements because it is impossible to capture all temporal, spatial, and behavioral characteristics that are implicitly melted in real user mobility. Along with the recent advancements of deep learning technologies, there have been several challenging proposals that exploit the power of the deep learning, especially generative models, in mobility synthesis. This paper reviews and summarizes recently proposed user mobility synthesis schemes based on generative adversarial networks that have been one of the most leading deep learning technologies for the last few years.

Keyword— user mobility, mobility synthesis, mobility generation, mobility trace synthesis, mobility trace generation, generative adversarial networks, GAN

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