

**Theory of Automata Report**

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Contents

[**1.** **Application of Finite Machines in Mobile Networks** 4](#_Toc106643894)

[**a.** **Finite State Machines: Preserving Privacy When Data-Mining Cellular Phone Networks** 4](#_Toc106643895)

[Abstract: 4](#_Toc106643896)

[Privacy Issues: 4](#_Toc106643897)

[Finite State Machines and Privacy Management: 4](#_Toc106643898)

[Finite State Machines guarding Cellular Networks Privacy: 4](#_Toc106643899)

[**b.** **Computation Termination and Malicious Node Detection using Finite State Machine in Mobile Adhoc Networks** 5](#_Toc106643900)

[**c.** **VLSI Implementation of Fast Connected Component Labeling Using Finite State Machine Based Cell Network** 5](#_Toc106643901)

[**d.** **Applying Weighted Finite State Machines to Protocol Performance Analysis** 5](#_Toc106643902)

[**2.** **Citations** 5](#_Toc106643903)

[a. Jonathan Reades (2010) Finite State Machines: Preserving Privacy When Data-Mining Cellular Phone Networks, Journal of Urban Technology, 17:1, 29-40, DOI: 10.1080/10630731003597314 5](#_Toc106643904)

[b. S. V. Sonekar, M. Pal, M. Tote, S. Sawwashere and S. Zunke, "Computation Termination and Malicious Node Detection using Finite State Machine in Mobile Adhoc Networks," 2020 7th International Conference on Computing for Sustainable Global Development (INDACom), 2020, pp. 156-161, doi: 10.23919/INDIACom49435.2020.9083710. 5](#_Toc106643905)

[c. P. Roy and P. K. Biswas, "VLSI Implementation of Fast Connected Component Labeling Using Finite State Machine Based Cell Network," 2008 Sixth Indian Conference on Computer Vision, Graphics & Image Processing, 2008, pp. 238-243, doi: 10.1109/ICVGIP.2008.50. 5](#_Toc106643906)

[d. C. Ionescu, E. Berki and J. Nummenmaa, "Applying Weighted Finite State Machines to Protocol Performance Analysis," 2009 Fourth South-East European Workshop on Formal Methods, 2009, pp. 40-45, doi: 10.1109/SEEFM.2009.16. 5](#_Toc106643907)

# **Application of Finite Machines in Mobile Networks**

## **Finite State Machines: Preserving Privacy When Data-Mining Cellular Phone Networks**

### Abstract:

Owing to the recent advancements in the telecommunications sectors, researchers are now using telecommunications data from cellular networks. However, the use to user data from Cellular data poses new and difficult questions which require to maintain the balance between personal privacy and public good. This article proposes a unique solution to this intriguing problem, i.e. the use of Finite state Machines which as a technique is particularly suited to the specific computational and technical constraints of a cellular network. This approach allows the users to maintain their privacy while allowing the researchers to go forward by making the relevant data accessible to them.

### Privacy Issues:

Not long ago, due to the expensive price of hardware it was quite difficult to keep track of an individual’s digital whereabout using telecommunications. But due to the rapid advancements in the field of telecommunications and IT, it has now become possible readily keep track of virtually every person connected to the internet.

Readily available cellular data has made it possible to calculate preferred routes and destinations, the mode of transports (public or private) and broadly determining how humans interact with each other in this day and age. Although the use of cellular data for these purposes has a number of advantages but there is growing public concern over the use and misuse of personal cellular data for the kind of research that makes all these innovations possible.

One major issue about determining the privacy of individual upon cellular data is that its highly contextual, for example: people expect different levels of personal privacy when say, they are in a public place or inside their home. Hence, its quite difficult to lay out a uniform policy to determine what kind of collection of cellular data is ethical and what is the limit when it intrudes a user’s personal privacy.

### Finite State Machines and Privacy Management:

Finite State Machines share a lot of features with geographical agent based models. As a matter of fact, Finite State Machines have been embedded in many computer applications ranging from artificial intelligence research to Video games.

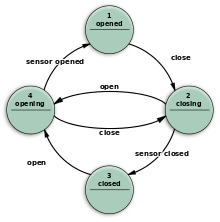
In its simples form, a finite state machine is built on two components: states and actions.

Figure 1 A simple finite state machine

### Finite State Machines guarding Cellular Networks Privacy:

## **Computation Termination and Malicious Node Detection using Finite State Machine in Mobile Adhoc Networks**

## **VLSI Implementation of Fast Connected Component Labeling Using Finite State Machine Based Cell Network**

## **Applying Weighted Finite State Machines to Protocol Performance Analysis**

# **Citations**

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