Software Rejuvenation in embedded systems 
and other more recent applications

Dr. Chandra M. Kintala 
Yahoo! Labs, Bangalore, India
kintala@yahoo-inc.com

Mobile communication devices have multitasking embedded software running in their 
operating systems (OS) as well as applications. Both the OS modules and the 
application components are assigned predetermined memory in those devices due to 
their near-realtime performance requirements. Memory (stack and heap) overflow 
problems occur in such software components because of programmer’s inability to 
accurately estimate the size of the needed memory and also because of Mandelbugs 
due to their complexity. A new software rejuvenation variation called Opportunistic 
Micro Rejuvenation (OMR) is proposed where a task that “misbehaves” is identified 
and rejuvenated at an opportune instant, like when it is in a waiting state. Following 
the traditional model for software rejuvenation†, a Stochastic Area Network model is 
used to simulate and study the availability of such embedded systems with OMR. It is 
shown that OMR alone will increase the availability only slightly but however when 
combined with other memory management techniques (such as shared supplementary 
memory), OMR will increase the availability significantly. I will also provide a brief 
survey of software rejuvenation in other more recent applications such as client- 
server systems, intrusion tolerance etc.

† Yennun Huang, Chandra Kintala, Nick Kolettis and N. Dudley Fulton; Software Rejuvenation: Analysis, 
pp. 381-390, Pasadena, CA, June 1995