groupoid C*-dynamical system

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Synonym	C*-groupoid system
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Related topic	SimilarityAndAnalogousSystemsDynamicAdjointness2
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Related topic	QuantumGroupoids2
Related topic	OrganismicSupercategoriesAndComplexS
Defines	C*-groupoid system
Defines	locally compact dynamical system
Defines	continuous groupoid automorphism
Defines	locally compact dynamical system with Haar measure
Defines	continuous groupoid homomorphism
Defines	dynamical system

Definition 0.1. A *C*-groupoid system* or *groupoid C*-dynamical system* is a *triple* $(A, \mathsf{G}_{lc}, \rho)$, where: A is a C*-algebra, and G_{lc} is a locally compact (topological) groupoid with a countable basis for which there exists an associated continuous Haar system and a continuous groupoid (homo) morphism $\rho : \mathsf{G}_{lc} \longrightarrow Aut(A)$ defined by the assignment $x \mapsto \rho_x(a)$ (from G_{lc} to A) which is continuous for any $a \in A$; moreover, one considers the norm topology on A in defining G_{lc}. (Definition introduced in ref. [**?**].)

Remark 0.1. A *groupoid C*-dynamical system* can be regarded as an extension of the ordinary concept of dynamical system. Thus, it can also be utilized to represent a quantum dynamical system upon further specification of the C*-algebra as a `http://planetmath.org/VonNeumannAlgebr` Neumann algebra, and also of G_{lc} as a `http://planetmath.org/QuantumGroupoids2`quantum groupoid; in the latter case, with additional conditions it can also simulate either `http://planetmath.org/Qua` automata, or variable classical automata, depending on the added restrictions (ergodicity, etc.).

References

[1] T. Matsuda, Groupoid dynamical systems and crossed product, II-case of C*-systems., *Publ. RIMS*, Kyoto Univ., **20**: 959-976 (1984).