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# Rendezvous and Gathering for Asynchronous Mobile Robots with Lights –Relationship between power of lights and synchrony–

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## Résumé

In recent years, cooperation of a large number of autonomous mobile robots has received much attention. We consider algorithmic issues of autonomous mobile robots and its computational power on a theoretical model. In the model, each robot is modeled as a point in a plane and its capability is quite weak. Robots are usually oblivious, anonymous and uniform and each robot implicitly communicates with other robots by observing the environment including the positions of other robots. In the basic common model, most tasks cannot be solved without some additional assumptions.

In this talk, we consider visible lights as an additional assumption and reveal the power of lights for autonomous mobile robots in asynchronous settings. In particular, we show some relationship between lights and other assumptions such as synchrony and restriction of robots moving and reveal boundary between solvability and unsolvability for gathering in which  $n$  robots must meet in finite time at a point that is not predefined and the special case that  $n=2$  (called rendezvous).

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Koichi Wada is currently serving as a Professor in the department of Applied Informatics under Faculty of Science and Engineering at Hosei University, Japan since April 2012. He is also serving as an Emeritus Professor at Nagoya Institute of Technology (NIT) since May, 2012. Earlier Prof. Wada received his PH.D degree in Information and Computer Science from Osaka University in 1983. He also served as a visiting Professor at ETH Zurich (Switzerland), RWTH, Aachen (Germany), University of Wisconsin Milwaukee (USA), University of Minnesota (USA). His current research includes graph theoretical concepts, ad-hoc sensor networks, parallel and distributed computing and big data. He is a member of ACM, IEEE, IPSJ, IEICE (fellow).

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