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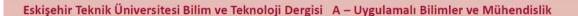
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Rooks

Haupt RL and Haupt SE. *Practical Genetic Algorithms*. 2nd ed. New York, NY, USA: Wiley, 2004.

Kennedy J and Eberhart R. Swarm Intelligence. San Diego, CA, USA: Academic Press, 2001.

Chapters in boks

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Conference proceedings

Li RTH and Chung SH. Digital boundary controller for single-phase grid-connected CSI. In: *IEEE 2008 Power Electronics Specialists Conference*; 15–19 June 2008; Rhodes, Greece. New York, NY, USA: IEEE. pp. 4562-4568.

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