Universitatea Transilvania din Brașov

ADMISSION TO DOCTORAL STUDIES   Session September 2024

Field of doctoral studies: Mechatronics and Robotics
Doctoral supervisor: Prof. Dr. Sorin Grigorescu

TOPICS FOR THE ADMISSION TO DOCTORAL STUDIES

TOPIC 1: *Robotic perception using graphs and artificial intelligence methods*
Recommended bibliography:

[1]   Sorin Grigorescu, Cosmin Ginerică, Machine Learning, Transilvania University, 2017.
[2]   Sorin Grigorescu, Computer Vision Systems, Transilvania University, 2018.
[3]   Richard Hartley, Andrew Zisserman, *Multiple View Geometry in Computer Vision*, Cambridge University Press, 2004.
[4]   Zachary Teed, Deng Jia, "DROID-SLAM: Deep Visual SLAM for Monocular, Stereo, and RGB-D Cameras", Advances in neural information processing systems NeurIPS, 2021.
[5]   Ian Goodfellow, Yoshua Bengio and Aaron Courville, Deep Learning, MIT Press, 2016.
[6]   Peter Corke, Robotics, Vision and Control, Springer, 2017.
[7]   Bruno Siciliano, Lorenzo Sciavicco, Luigi Villani, Giuseppe Oriolo, Robotics: Modelling, Planning and Control, Springer, 2009.

TOPIC 2: *Artificial intelligence methods for legged robots*
Recommended bibliography:

[1]   Sorin Grigorescu, Cosmin Ginerică, Machine Learning, Transilvania University, 2017.
[2]   Marc Raibert, Legged Robots that Balance, MIT Press, 1986.
[3]   Ian Goodfellow, Yoshua Bengio and Aaron Courville, Deep Learning, MIT Press, 2016.
[4]   Peter Corke, Robotics, Vision and Control, Springer, 2017.
[5]   Bruno Siciliano, Lorenzo Sciavicco, Luigi Villani, Giuseppe Oriolo, Robotics: Modelling, Planning and Control, Springer, 2009.

TOPIC 3: *Artificial intelligence methods for collaborative robotic control*
Recommended bibliography:

[1]   Sorin Grigorescu, Cosmin Ginerică, Machine Learning, Transilvania University, 2017.
[2]   Ian Goodfellow, Yoshua Bengio and Aaron Courville, Deep Learning, MIT Press, 2016.
[3]   Peter Corke, Robotics, Vision and Control, Springer, 2017.
[4]   Bruno Siciliano, Lorenzo Sciavicco, Luigi Villani, Giuseppe Oriolo, Robotics: Modelling, Planning and Control, Springer, 2009.

TOPIC 4: *Artificial intelligence methods for 3D perception in robotic systems*

Recommended bibliography:

[1] Sorin Grigorescu, Cosmin Ginerică, Machine Learning, Transilvania University, 2017.

[2] Sorin Grigorescu, Computer Vision Systems, Transilvania University, 2018.

[3] Richard Hartley, Andrew Zisserman, *Multiple View Geometry in Computer Vision*, Cambridge University Press, 2004.

[4] Ian Goodfellow, Yoshua Bengio and Aaron Courville, Deep Learning, MIT Press, 2016.

[5] Peter Corke, *Robotics, Vision and Control*, Springer, 2017.

[6] Bruno Siciliano, Lorenzo Sciavicco, Luigi Villani, Giuseppe Oriolo, *Robotics: Modelling, Planning and Control*, Springer, 2009.

TOPIC 5: *Artificial intelligence methods for self-driving cars*

Recommended bibliography:

[1] Sorin Grigorescu, Cosmin Ginerică, Machine Learning, Transilvania University, 2017.

[2] Sorin Grigorescu, Computer Vision Systems, Transilvania University, 2018.

[3] Richard Hartley, Andrew Zisserman, *Multiple View Geometry in Computer Vision*, Cambridge University Press, 2004.

[4] Ian Goodfellow, Yoshua Bengio and Aaron Courville, Deep Learning, MIT Press, 2016.

[5] Peter Corke, Robotics, Vision and Control, Springer, 2017.

[6] Bruno Siciliano, Lorenzo Sciavicco, Luigi Villani, Giuseppe Oriolo, Robotics: Modelling, Planning and Control, Springer, 2009.

TOPIC 6: *Unsupervised learning for perception and control in robotics*

Recommended bibliography:

[1] Sorin Grigorescu, Cosmin Ginerică, Machine Learning, Transilvania University, 2017.

[2] Sorin Grigorescu, Sisteme de Vedere Artificială, Editura Universității Transilvania, 2018.

[3] Ian Goodfellow, Yoshua Bengio and Aaron Courville, Deep Learning, MIT Press, 2016.

[4] Peter Corke, Robotics, Vision and Control, Springer, 2017.

[5] Bruno Siciliano, Lorenzo Sciavicco, Luigi Villani, Giuseppe Oriolo, Robotics: Modelling, Planning and Control, Springer, 2009.

TOPIC 7: *Artificial intelligence methods for path planning in robotic systems*

Recommended bibliography:

[1] Sorin Grigorescu, Cosmin Ginerică, Machine Learning, Transilvania University, 2017.

[2] Sorin Grigorescu, Sisteme de Vedere Artificială, Editura Universității Transilvania, 2018.

[3] Ian Goodfellow, Yoshua Bengio and Aaron Courville, Deep Learning, MIT Press, 2016.

[4] Peter Corke, Robotics, Vision and Control, Springer, 2017.

[5] Bruno Siciliano, Lorenzo Sciavicco, Luigi Villani, Giuseppe Oriolo, Robotics: Modelling, Planning and Control, Springer, 2009.

TOPIC 8: *Livelong learning of action primitives in legged robots*
Recommended bibliography:

[1] Sorin Grigorescu, Cosmin Ginerică, Machine Learning, Transilvania University, 2017.

[2] Sorin Grigorescu, Sisteme de Vedere Artificială, Editura Universității Transilvania, 2018.

[3] Ian Goodfellow, Yoshua Bengio and Aaron Courville, Deep Learning, MIT Press, 2016.

[4] Peter Corke, Robotics, Vision and Control, Springer, 2017.

[5] Bruno Siciliano, Lorenzo Sciavicco, Luigi Villani, Giuseppe Oriolo, Robotics: Modelling, Planning and Control, Springer, 2009.
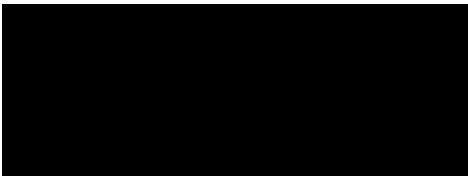
Doctoral supervisor,   Coordinator of the field of doctoral studies,

Prof. Dr. Sorin Grigorescu   Prof. Dr. Sorin Grigorescu