

## REGISTRATION FORM FOR CZECH SCIENTIFIC INSTITUTION

**1. Research institution data (name and address):**

**Faculty of Informatics**

**Masaryk University**

Botanická 68a

Brno 602 00

**2. Type of research institution:** Public university (veřejná vysoká škola)

**3. Head of the institution:** prof. RNDr. Jiří Zlatuška, CSc. — Dean

**4. Contact information of designated person(s) for applicants:**

prof. RNDr. Petr Hliněný, Ph.D. — Vice-Dean for Research, Development, and Doctoral Studies

hlineny@fi.muni.cz

Faculty of Informatics, Masaryk University

Botanická 68a, Brno 602 00

**5. Research discipline in which the strong international position of the institution ensures establishing a Dioscuri Centre:**

**Natural Sciences and Technology:** *Mathematics* – all areas of mathematics, pure and applied, as well as mathematical foundations of computer science, physics and statistics

**6. Description of important research achievements from the selected discipline from the last 5 years including a list of the most important publications, patents, or other results:**

**Top publications**

- GRZESIK, Andrzej, Daniel KRÁL' a Laszlo Miklos LOVASZ. Elusive extremal graphs. **Proceedings of the London mathematical society**. Cambridge: Cambridge University Press, 2020, No. 121, 6, p. 1685-1736. ISSN 0024-6115. doi:10.1112/plms.12382.
- CAGIRICI, Onur, Petr HLINĚNÝ, Filip POKRÝVKA a Abhisekh SANKARAN. Clique-Width of Point Configurations. **Journal of Combinatorial Theory, Ser B**. Elsevier B. V., 2021, p. 1-31. ISSN 0095-8956. doi:10.1016/j.jctb.2021.09.001.
- JANČÁR, Ján, Vladimír SEDLÁČEK, Petr ŠVENDA a Marek SÝS. Minerva: The curse of ECDSA nonces. In Amir Moradi, Mehdi Tibouchi. **IACR Transactions on Cryptographic Hardware and Embedded Systems**. Ruhr-University of Bochum, 2020. s. 281-308. ISSN 2569-2925. doi:10.13154/tches.v2020.i4.281-308.
- MAIER-HEIN, Lena, Annika REINKE, Michal KOZUBEK, Anne L. MARTEL, Tal ARBEL, Matthias EISENMANN, Allan HANBURY, Pierre JANNIN, Henning MÜLLER, Sinan ONOGUR, Julio SAEZ-RODRIGUEZ, Bram VAN GINNEKEN, Annette KOPP-SCHNEIDER a Bennett A. LANDMAN. BIAS: Transparent reporting of biomedical image analysis challenges. **Medical Image Analysis**. Elsevier, 2020, No. 66, December, p. "101796", 7 p. ISSN 1361-8415. doi:10.1016/j.media.2020.101796.
- COOPER, Jacob, Daniel KRÁL' a TL MARTINS. Finitely forcible graph limits are universal. **Advances in Mathematics**, 2018. No. 340, December, p. 819-854. ISSN 0001-8708. doi:10.1016/j.aim.2018.10.019.
- BRÁZDIL, Tomáš, Krishnendu CHATTERJEE, Antonín KUČERA, Petr NOVOTNÝ, Dominik VELAN a Florian ZULEGER. Efficient Algorithms for Asymptotic Bounds on Termination Time in VASS. In Anuj Dawar, Erich Gradel. **2018 33<sup>rd</sup> Annual ACM/IEEE Symposium on Logic in Computer Science (LICS)**. Oxford, England: ACM, 2018. p. 185-194. ISBN 978-1-4503-5583-4. doi:10.1145/3209108.3209191.
- NEMEC, Matúš, Marek SÝS, Petr ŠVENDA, Dušan KLINEC a Václav MATYÁŠ. The Return of Coppersmith's Attack: Practical Factorization of Widely Used RSA Moduli. In **Proceedings of the 2017 ACM SIGSAC Conference on Computer and Communications Security**. New York, NY, USA: ACM, 2017. s. 1631-1648. ISBN 978-1-4503-4946-8. doi:10.1145/3133956.3133969.

**The overall importance** of our research achievements is witnessed also by the following: in the **CSRankings'** ranking of top computer science institutions, in the particular research area of CS Logic & Verification, the Faculty of Informatics of Masaryk University currently scores on 16th place in the world:

<https://csrankings.org/#/fromyear/2011/toyear/2021/index?log&world>

**7. List of no more than 3 important research projects in the selected discipline awarded in national and international calls to the institution in the last 5 years:**

**Large Discrete Structures**

prof. Daniel Kráľ

H2020-ERC

1392894 EUR

**Structure of tractable instances of hard algorithmic problems on graphs**

prof. Hliněný

GAĚR

8268000 CZK

**Models, Algorithms, and Tools for Solving Adversarial Security Problems**

prof. Antonín Kučera

US ARMY

344736 USD

## **8. Description of the available laboratory and office space for a Dioscuri Centre:**

Scientific research at FI is organized rather informally, within flexible research groups which can quickly respond to current challenges and trends in the scientific world. There are around twenty active laboratories at the faculty in which researchers and students perform leading-edge research, often in cooperation with companies located in the science and technology park directly in the FI building.

Office space and standard computing equipment and support will be provided for a new research group. The standard institutional background also includes seminar and meeting rooms and access to supercomputing resources.

Importantly, the Faculty of Informatics premises include also the **CERIT-SP: Science & Technology Park and Business Incubator**. Since 2014, this Technology Park has hosted around 20 Hitech IT companies within an office space of 2,200 sqm directly in the FI buildings. This park offers unique opportunities for more applied research and technology transfer in collaboration with students, researchers and the companies in the park.

## 9. List of the available research equipment for a Dioscuri Centre:

As stated above, we offer incoming researchers standard office and computing equipment, and access to the **CERIT-SP** Science & Technology Park and Business Incubator in the faculty building. For special research needs in areas for which the standard office equipment and infrastructure are not sufficient, we offer the following specially equipped laboratories:

- Centre for Biomedical Image Analysis — microscopy imaging, related special computing equipment
- The Human Computer Interaction Laboratory — equipment for virtual and augmented reality
- Centre for Research on Cryptography and Security — equipment for research with smartcards, IoT and other cryptography and security research
- Cybersecurity Laboratory (CYBERSEC) — cybersecurity monitoring and training environment, unique KYPO cyber range
- Design and Architecture of Digital Systems Laboratory — hardware, FPGA and signal processing tools and measurement
- Research laboratory Sitola - advanced technologies for high-performance computing, big data processing, and high-speed networking

**10. List of the additional benefits (other than listed in the conditions for hosting a DC, see invitation) that the Institution declares to provide for a Dioscuri Centre (i.e.: additional funds, personal benefits, dual career options, relocation support or other):**

Our faculty offers an opportunity not only to get involved in cutting-edge research, but provides complete project support and English-speaking administrative staff, and also full support during the onboarding process. Tenure track positions are offered to scientists interested in participating in research at FI and contributing to its further development.

The Faculty of Informatics is a proud holder of the HR Award HRS4R. In April 2021 the Faculty of Informatics, Masaryk University, successfully completed the Initial Phase and has been successfully certificated by the European Commission. The personnel policy and work with human resources is a part of the Faculty's Long-term strategy and the part of the HR Award is entrusted, by the Organizational Rules of the Faculty, to the Office for Research and Development, Projects and Partners.

Masaryk University (MU) also has the Gender Equality Plan for 2020-2025 according to the goals of the European Union.

**11. Other information about the internationalization of the research institution, international researchers employed at the institution, the availability of English language seminars etc.:**

The Faculty of Informatics (FI) was founded in 1994 as the first Faculty of Informatics in the Czech Republic. Today, with a steady increase of interest to study, it provides Computer Science education at all levels of university studies for two thousand students in Czech and English. The faculty offers 2 master's programmes ("Computer Systems, Communication and Security", "Software Systems and Services Management"), and also a doctoral study programme "Computer Science" with 2 specializations in English. Currently, there are 13 students from abroad attending the English doctoral programme, but all our doctoral students conduct their research in English regardless of the official study language.

The Faculty of Informatics is committed to offering excellent conditions for research and international collaboration in computer science, and for employment of international research and academic staff. Currently, international research staff includes Achim Blumensath, Bruno Rossi, Bacem Mbarek, Hind Bangui, Simone Kriglstein, Daniel R. E. Giraldo.

The faculty also regularly offers Postdoc positions to international applicants in all areas of CS. We currently host four international postdocs.

The Faculty of Informatics regularly invites distinguished foreign and domestic **scientists** to give plenary lectures at the weekly **Informatics Colloquium** (with a tradition dating back to 1997) and on additional important occasions.

Masaryk University awards honorary degrees to outstanding personalities and we are proud that in the field of Computer Science this award has been given to personalities such as prof. Donald Knuth, prof. Charles Bennett, prof. Thomas A. Henzinger, prof. Javier Esparza, etc.

On the other hand, the excellent international standing of our scientists is witnessed not only by numerous international projects they are involved in (see examples listed above), but also by international prizes and awards they have got, among which we mention the following three outstanding examples: prof. Jozef Gruska (Computer Pioneer Award 1996, IEEE Computer Society), prof. Antonín Kučera (Friedrich Wilhelm Bessel Research Award, 2016), and prof. Daniel Král' (Fellow of the American Mathematical Society, 2020 class).