How to ensure human-centric and ethical operation of AI, its transparency and respect for the fundamental human rights while preserving the benefits of AI?

### HCAI topics
- **HCAI**
  - Personal and institutional autonomy and freedom: data security and privacy
- **Human-centric data analysis by design**
  - MLOps, prior knowledge, explanation, active learning, machine teaching in cooperative intelligence, automated data analytics
- **Human-centric knowledge engineering**
  - Coding systems, ontologies, linked open data, summary statistics, automation of science (life sciences)
- **Classic ("existential risk")**
  - Benevolent AI: AI solutions for humans, societies, and mankind
- **Trustworthy AI**
  - Value compatibility, human safety, trust, respect for fundamental human rights
- **AI safety**
  - Formal methods in systems engineering
- **Human-computer interaction**
  - Improved cognitive enhancers: personal assistants in education, intelligent citizen and customer services, and decision support tools in personalized medicine
- **Improved sensorial man-machine interfaces**
  - Improved communication (speech, augmented reality) and human-computer interaction
- **Improved sensorimotoric man-machine cooperation**
  - Robotics, health-care assistance using wearable electronic devices, and automated driver assistance systems / autonomous vehicles
- **Smart devices, smart cities**
  - IoT, sensor fusion for predictive maintenance

### Didactic challenges
- How to mix engineering and human-centric (i.e. ethical, legal, social) knowledge in a single MSc course?
- How to demonstrate the human-centric approach in the whole design and development process of AI systems?
- How to apply the human-centric approach in practical exercises?
- How to prepare the students to comply with and monitor the legal regulations?

### Goal:
Deliver a 60 ECTS-credit Master’s degree programme in AI with a human-centric focus and strong legal, ethical, sociological and other social science perspectives.

### Realisation:
As a supplementary programme embedded into our current 120 ECTS-credit Computer Science Master’s programme. The majority of courses are held in Hungarian.

### Course Mapping and credit requirements at BME VIK

<table>
<thead>
<tr>
<th>Course Group</th>
<th>Course title</th>
<th>ECTS</th>
<th>Specialization</th>
<th>C</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td><strong>I. HCAIM basic courses:</strong></td>
<td>min. 45, max. 60 credits by completing a number of common, specialization-dependent or elective Computer Science courses, at least one course from each course group.</td>
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<tr>
<td><strong>II. HCAIM optional courses:</strong></td>
<td>max. 20 credits by completing a number of common or specialization-dependent Computer Science courses, at most one course from each course group.</td>
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<tr>
<td><strong>III. HCAIM optional courses:</strong></td>
<td>the missing credits (max. 15) may be obtained by completing a few HCAI-related elective courses (prior arrangement with the Dean’s Office is required).</td>
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</tbody>
</table>

### How to obtain the 60 ECTS-credits* at BME VIK?

**I. HCAIM basic courses:**
- At least one course from each course group.

**II. HCAIM optional courses:**
- At least one course from each course group.

**III. HCAIM optional courses:**
- The missing credits (max. 15) may be obtained by completing a few HCAI-related elective courses (prior arrangement with the Dean’s Office is required).

* ECTS: European Credit Transfer and Accumulation System

### Common HCAI-approach
- 4 modules, composed of technical, practical and human-centric components, defined by
  - Bodies of Knowledge and Skills
  - Lesson Plans,
  - Learning Events, and
  - Learning Outcomes.

Are you interested, would you like to join the HCAI Master’s at BME VIK? Then register at https://forms.office.com/e/H4CQFA5JWY (with a BME Sharepoint / Directory account).

Completing the form does not imply any obligation and does not count as an application for the Master’s programme.

Those who fill in the form will be added to an MS Teams group, and will be regularly informed about the latest developments in the HCAI Master’s programme, and the project advancements that might concern them.

### Acknowledgement
HCAI Master’s (HCAIM) project, grant No CEF-TC-2020-1 Digital Skills 2020-EU-IA-0068, Budapest University of Technology and Economics (BME)