

TouchIt 3D

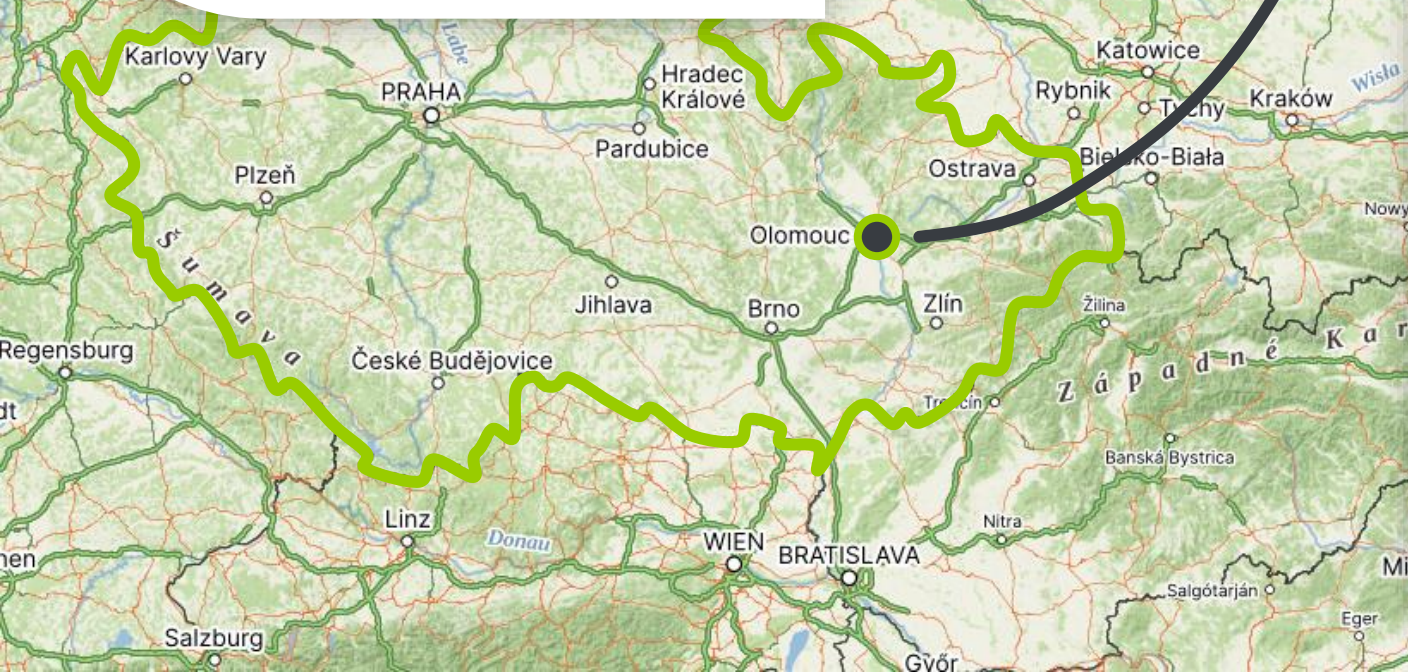
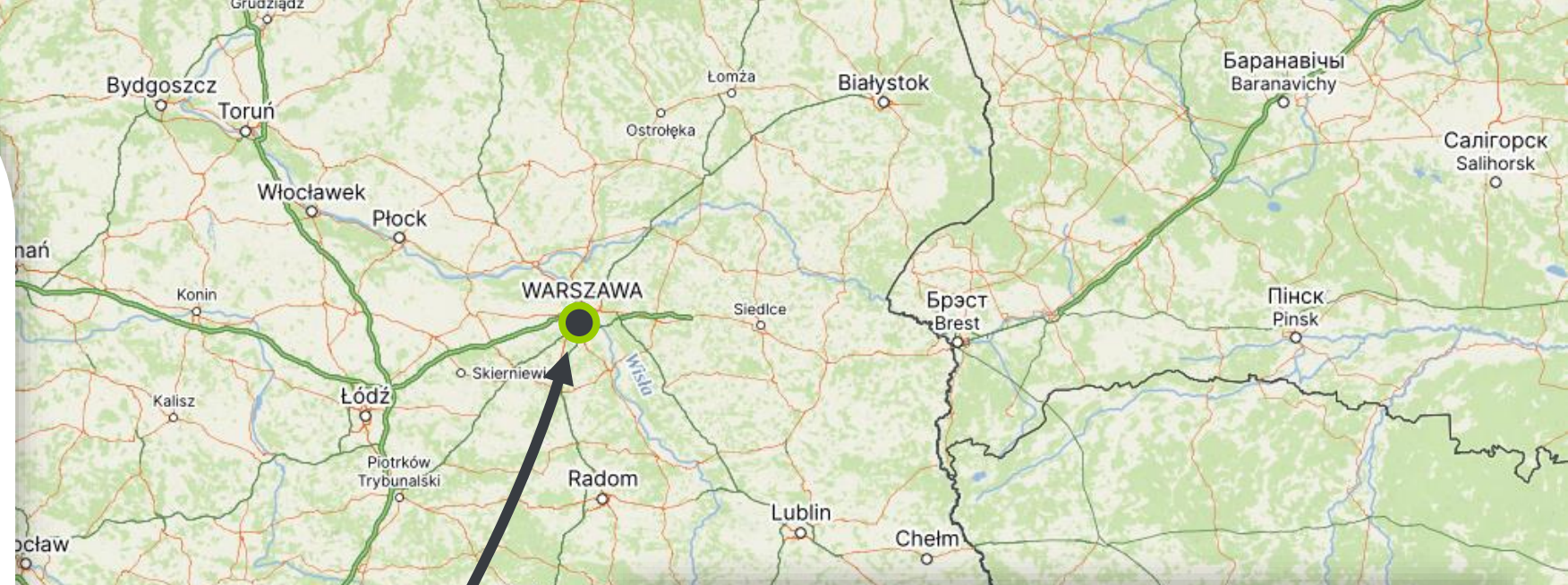
INTERACTIVE TACTILE MAPS & MODELS
LINKABLE WITH MOBILE DEVICES

RADEK BARVÍŘ

PALACKÝ UNIVERSITY OLMOUC

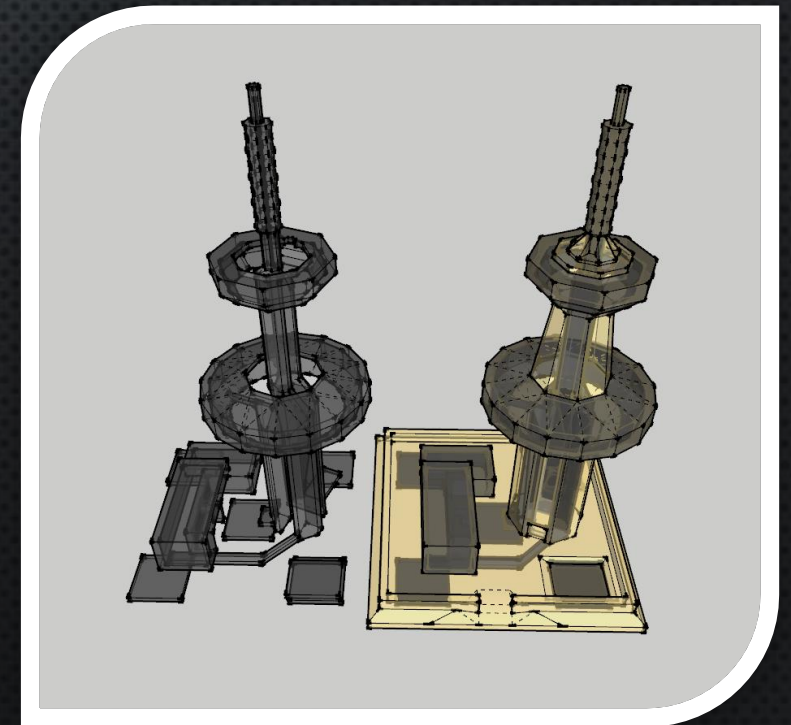
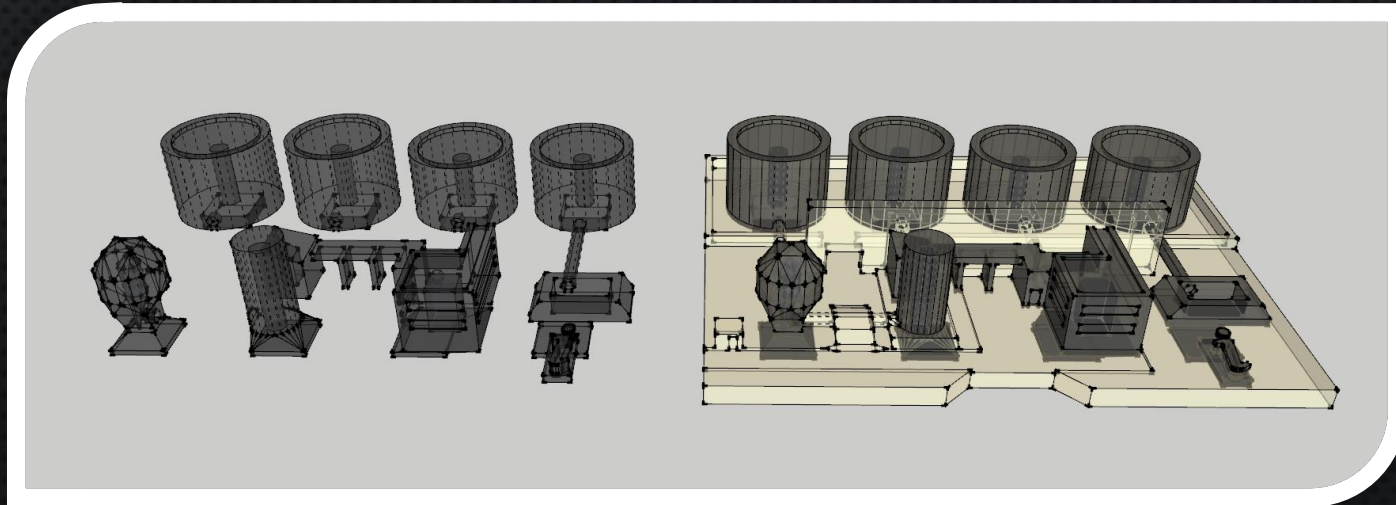


Palacký University
Olomouc



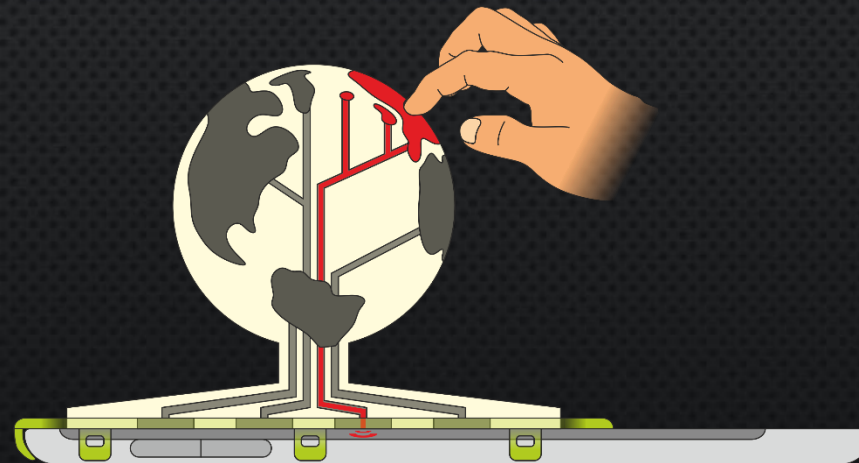
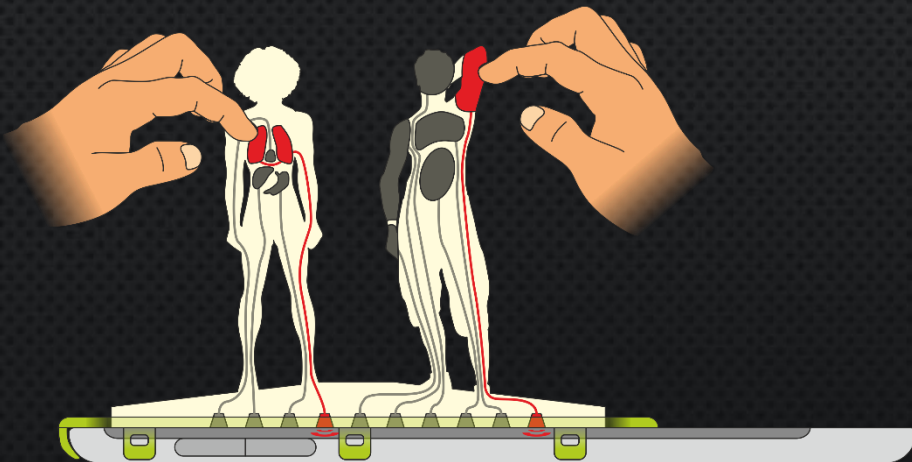
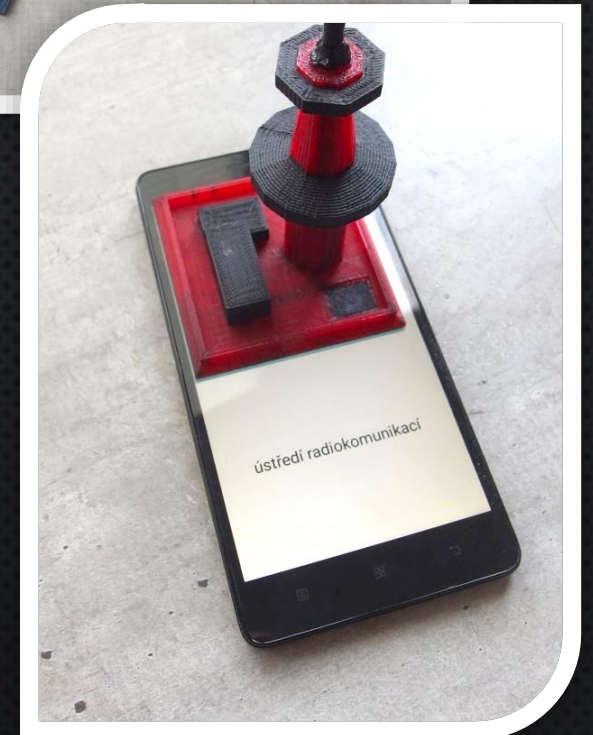
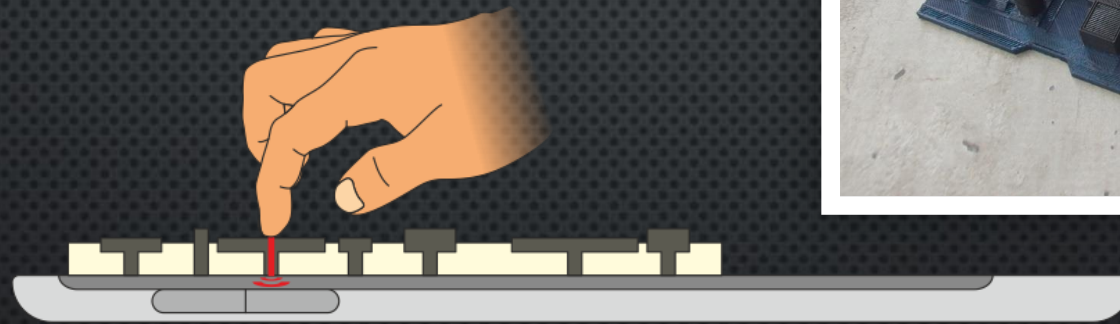
EARLY DEVELOPMENT (2015–2016)

- COMING WITH TECHNOLOGY **TouchIt3D**
- LINKING MOBILE DEVICES WITH 3D-PRINTED MODELS
- TESTING FUNCTIONALITY AND ITS LIMITS



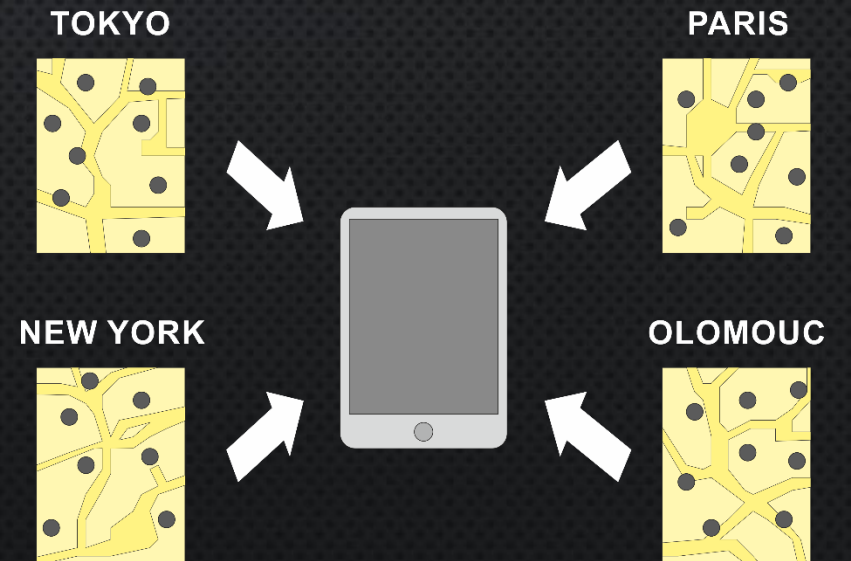
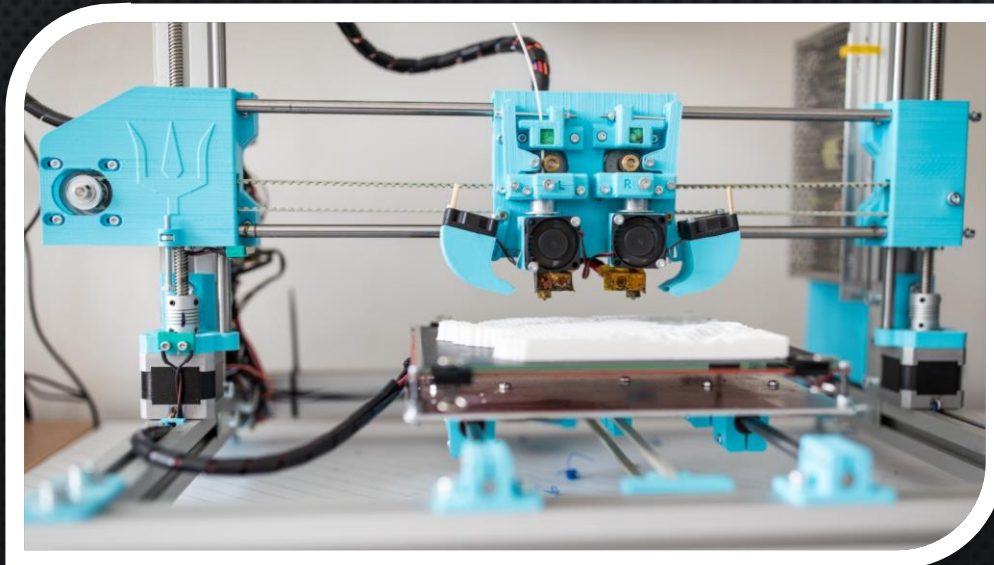
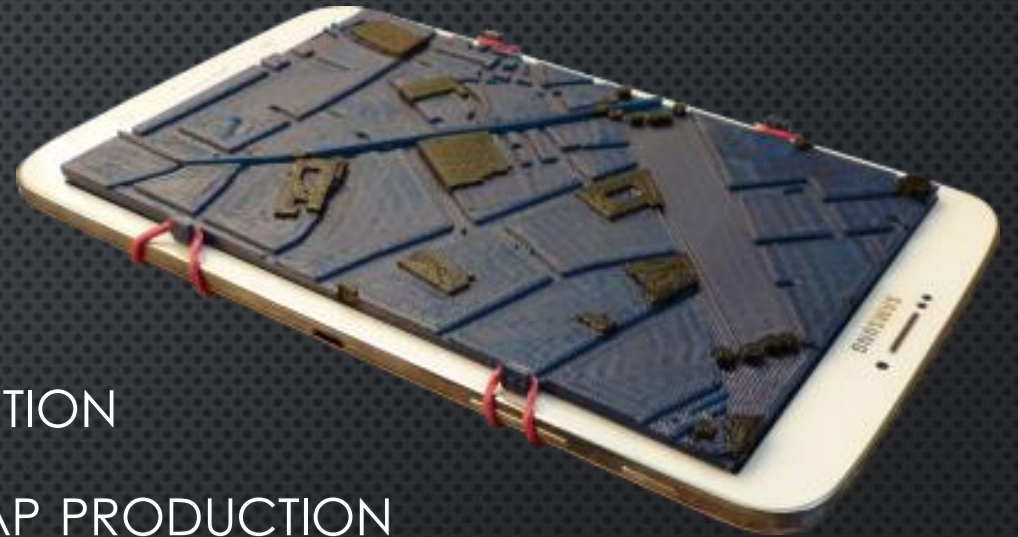
EARLY DEVELOPMENT

- 3D-PRINTED PLASTIC MODELS WITH CONDUCTIVE ELEMENTS



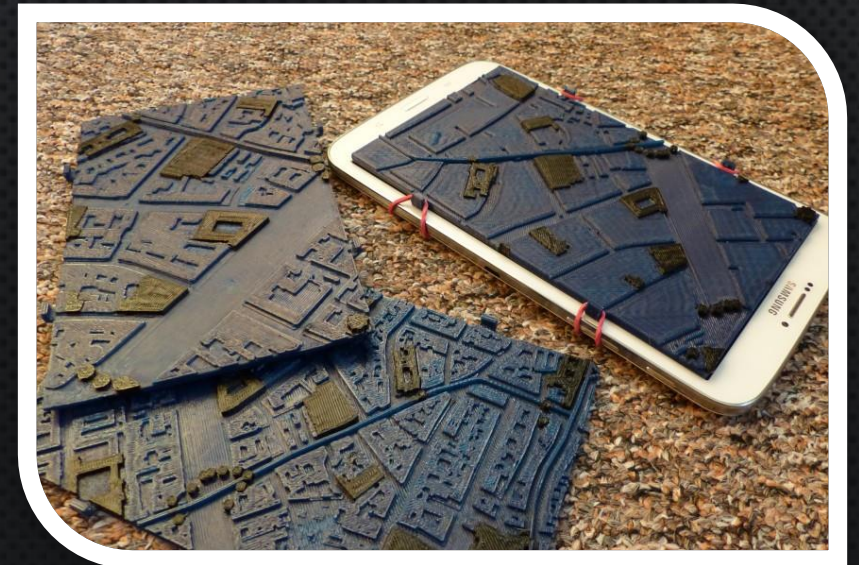
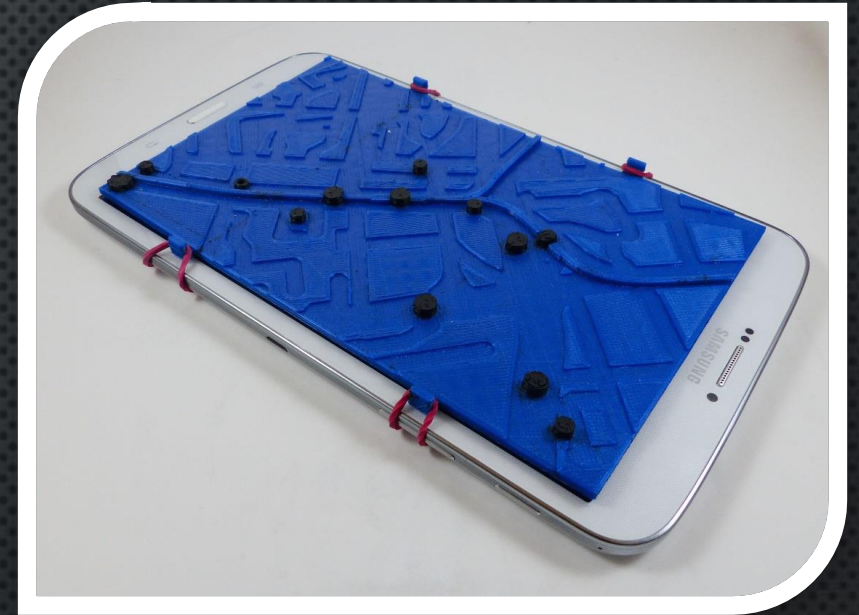
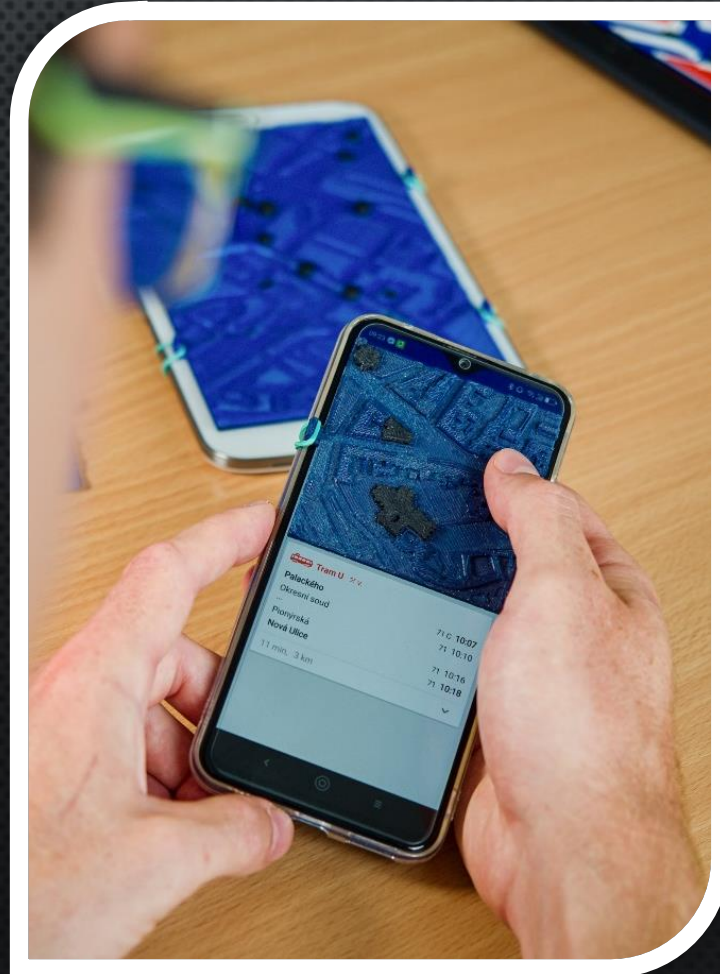
EFFICIENT TACTILE MAPS

- APPLYING **TouchIt3D** TO TACTILE MAPS
- ENRICHING INTERACTIVITY, AUDITIVE DESCRIPTION
- LOW-COST WAY OF INTERACTIVE TACTILE MAP PRODUCTION



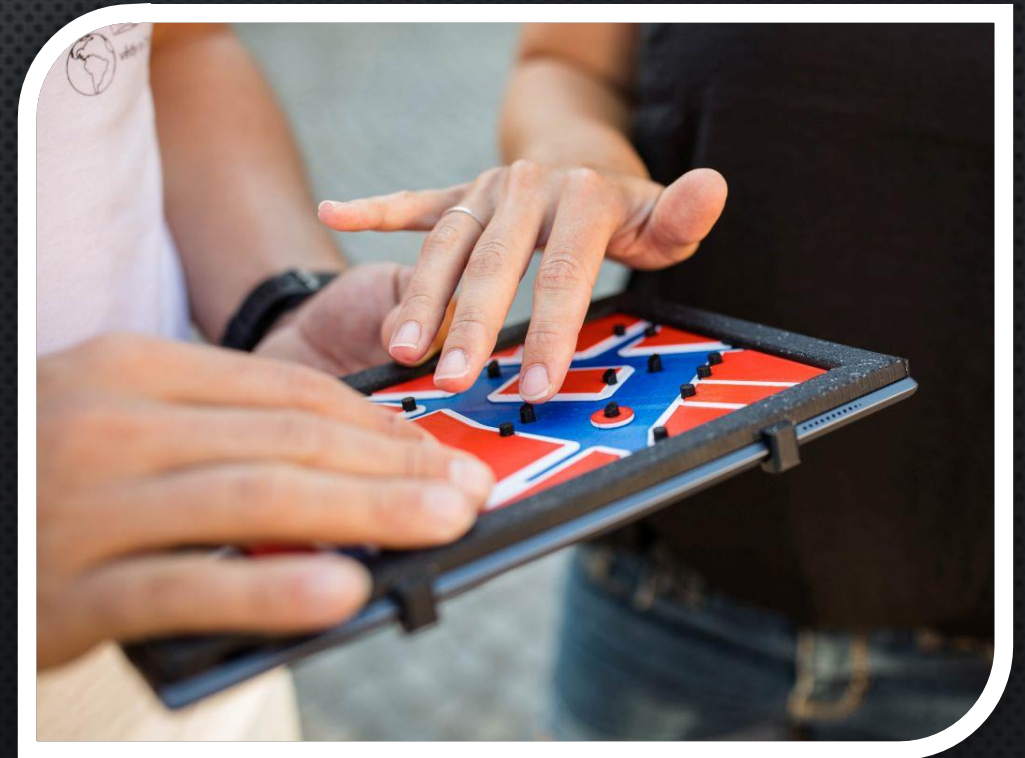
EFFICIENT TACTILE MAPS

- LINKABLE WITH ...
 - SMARTPHONES
 - TABLETS
- USING SIMPLE MOBILE APP



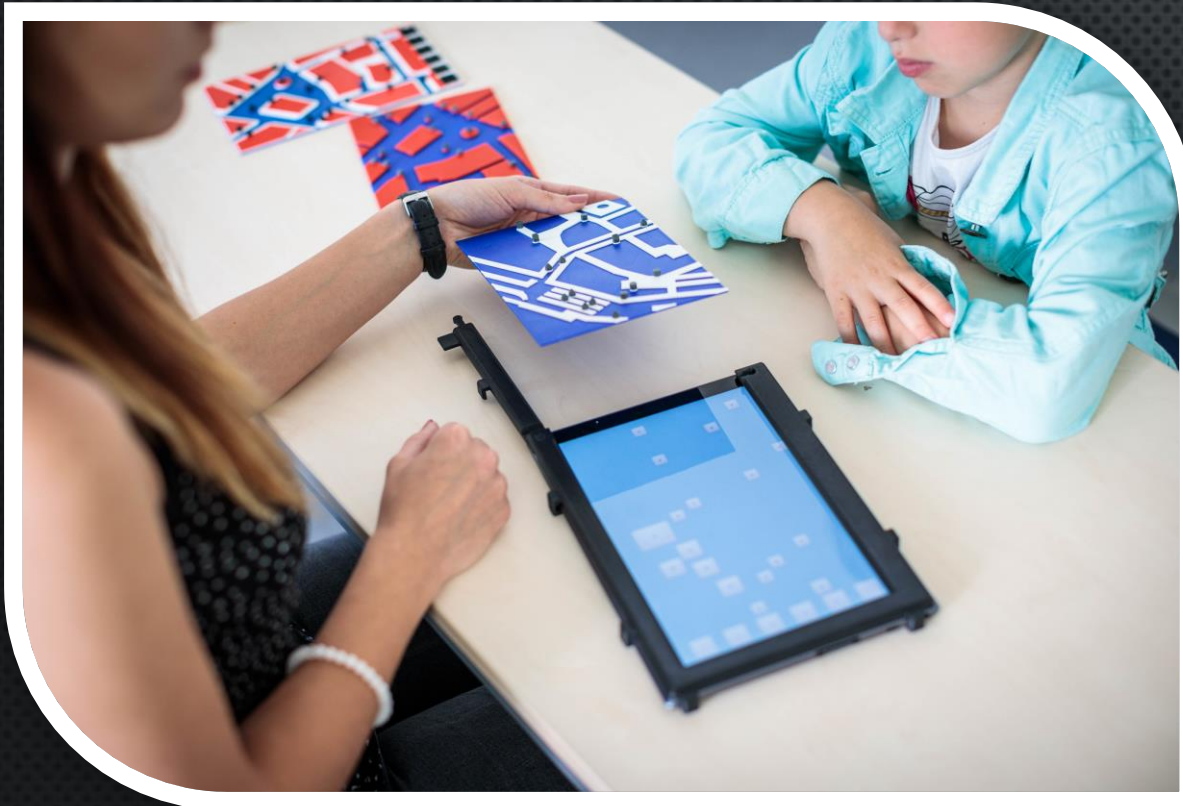
IMPROVING MAP FUNCTIONALITY (2018–2020)

- ADDING COLOURS TO ENHANCE LAYER DISTINGUISHNESS
- DIFFERENT MODES FOR AUDITIVE DESCRIPTION
 - SHORT & LONG DESCRIPTION
 - GIVING TASK AND RESPECTIVE FEEDBACK
 - PATH DESCRIPTIONS BETWEEN 2 LOCATIONS



SOFTWARE BACKGROUND

- TACTILEMAPTALK MOBILE APPLICATION



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  "language": "CZ",
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  "button1x": "38",
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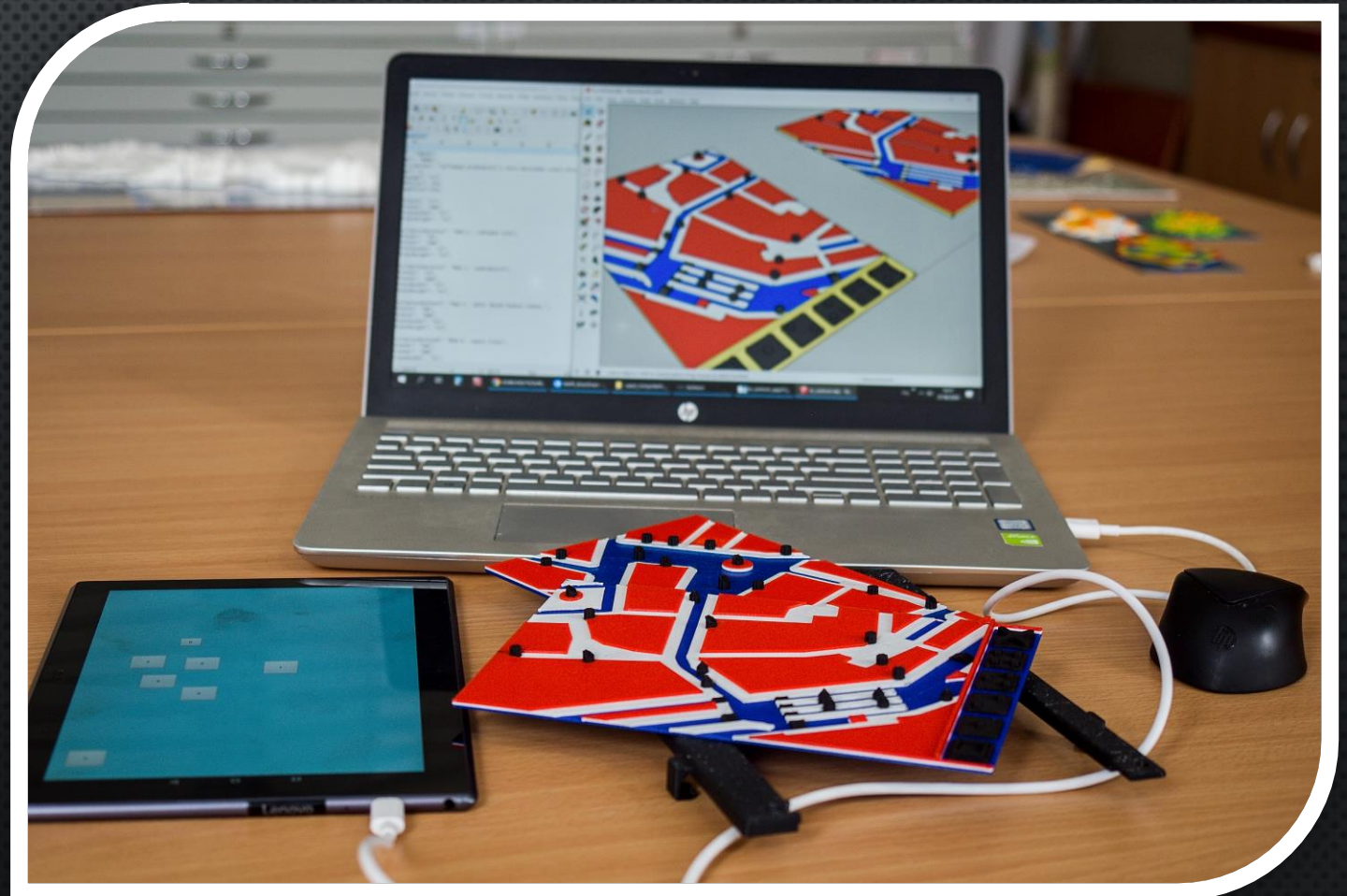
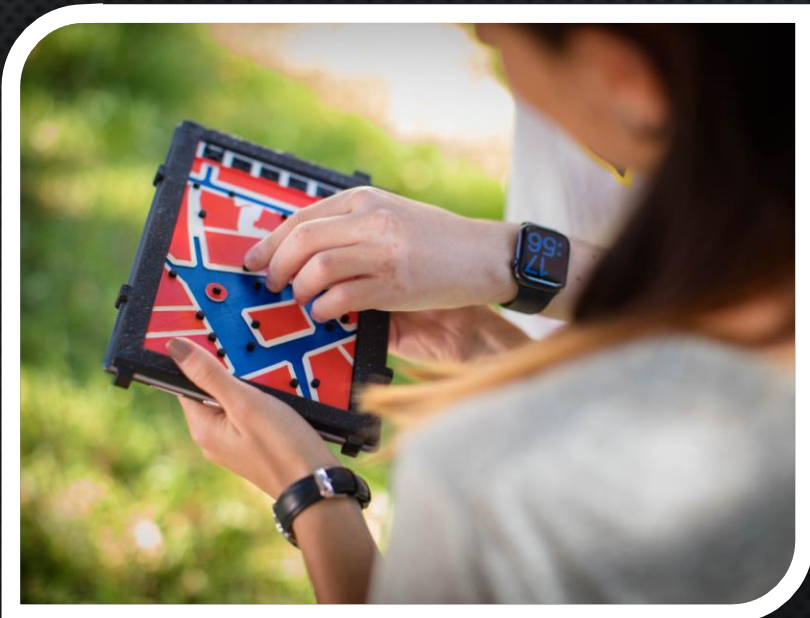
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    "label3": "toto není radnice, hledej kousek níže",
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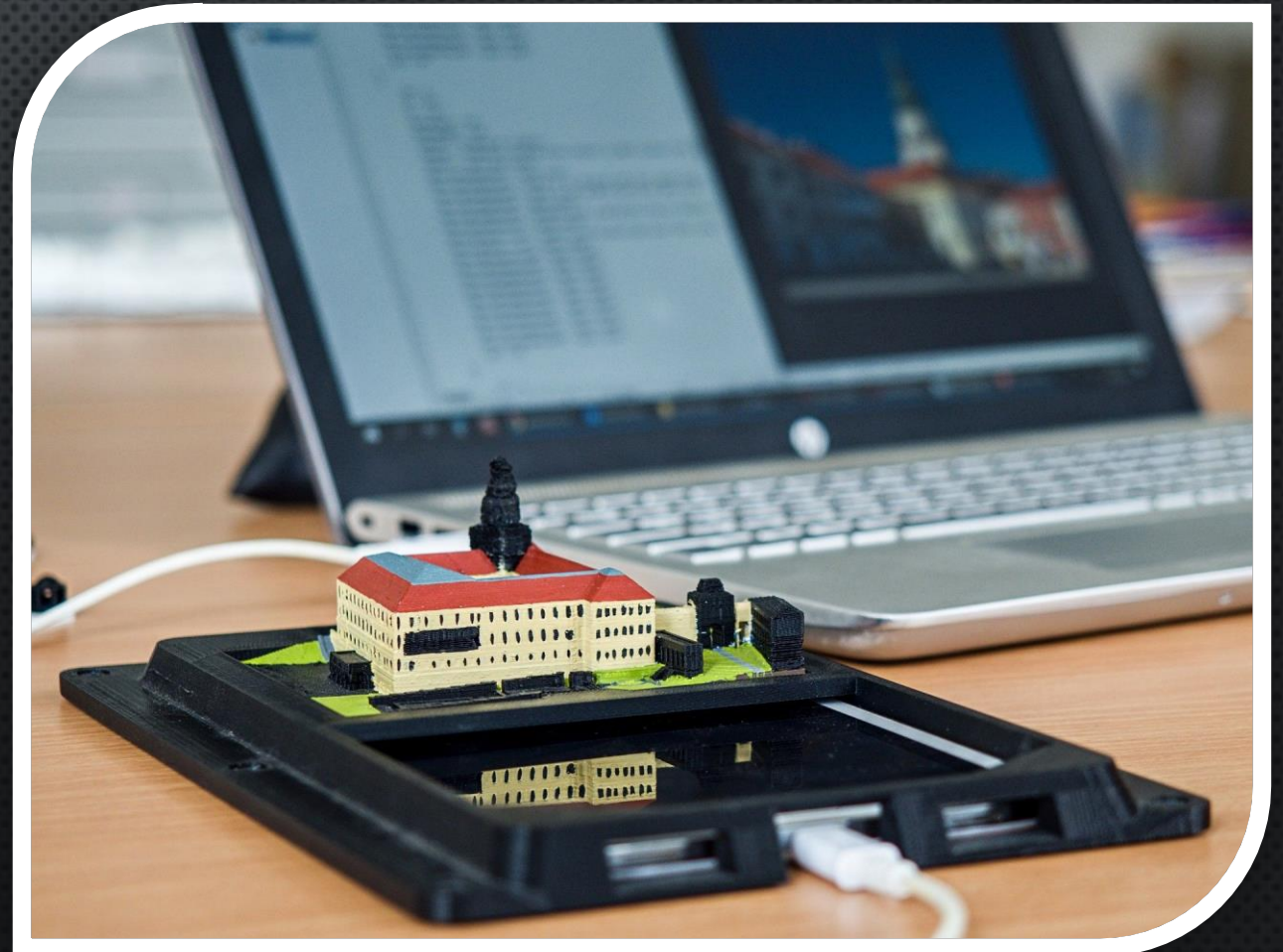
USER EVALUATION & TESTING

- BETTER COLOUR CONTRAST
- IMPROVING DISTINGUISHABILITY OF MAP SYMBOLS



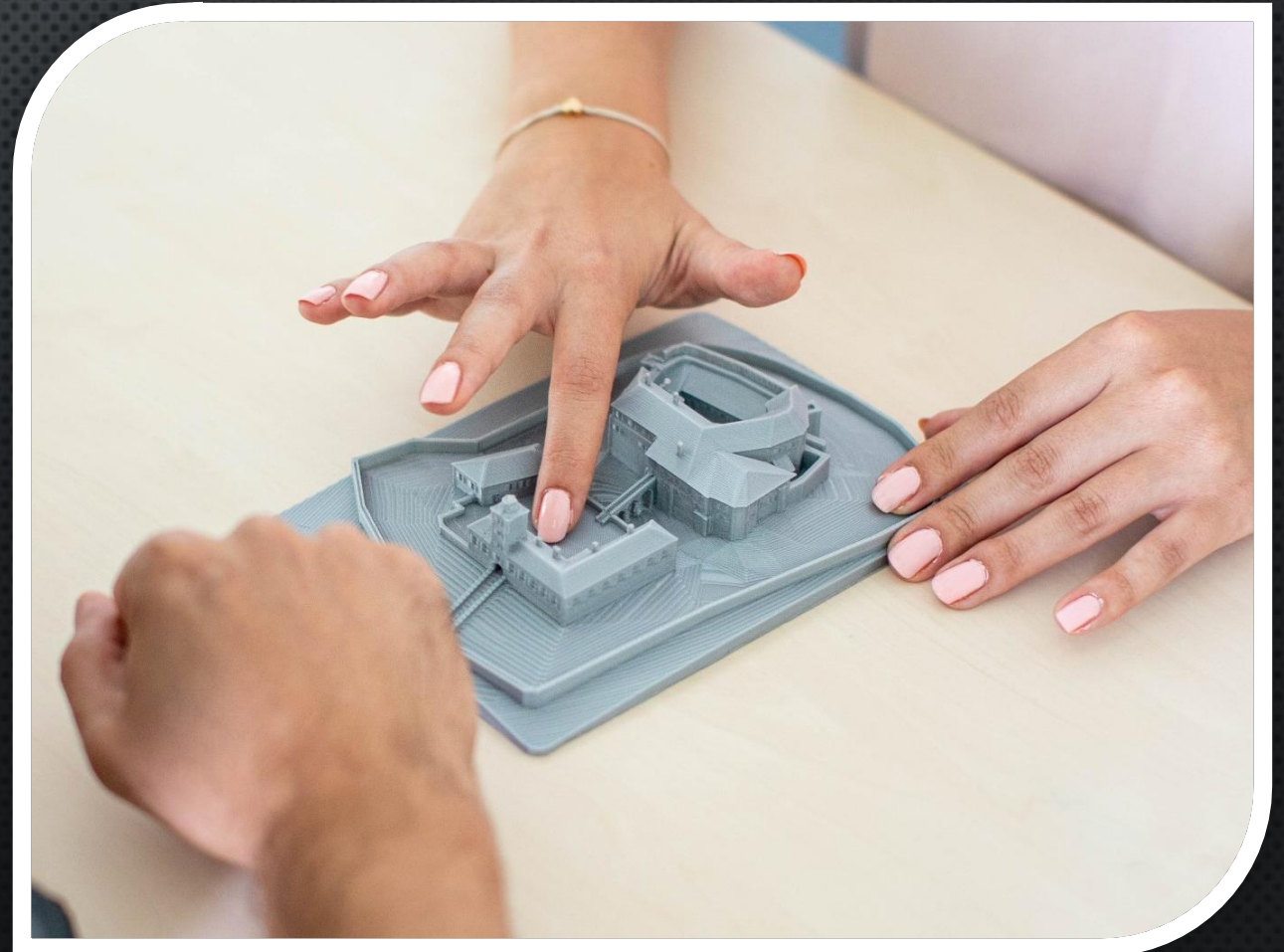
FROM MAPS BACK TO 3D MODELS (2020–2023)

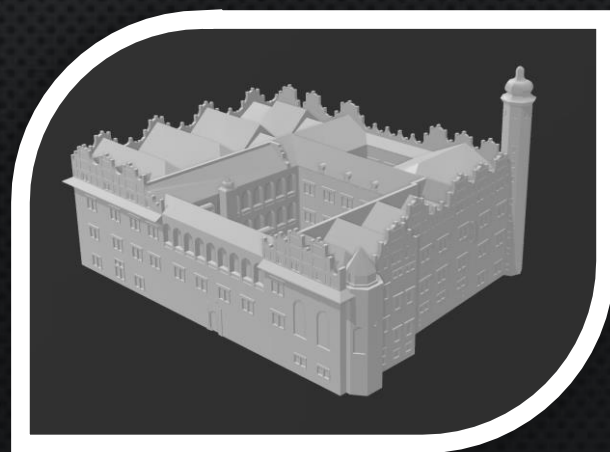
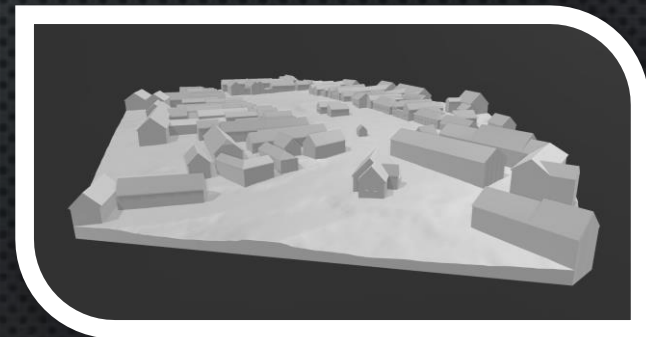
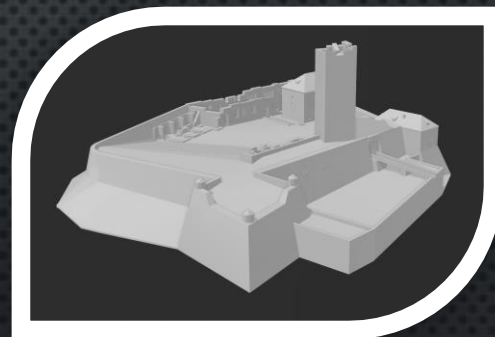
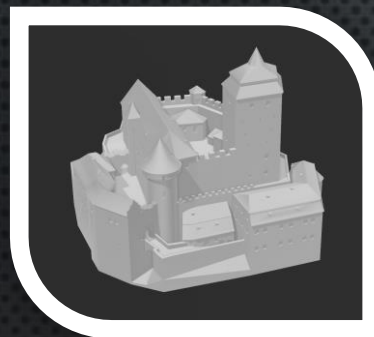
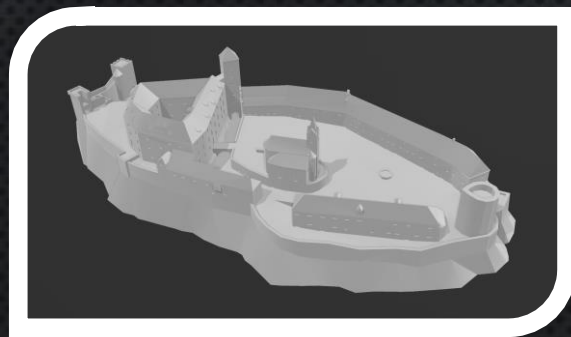
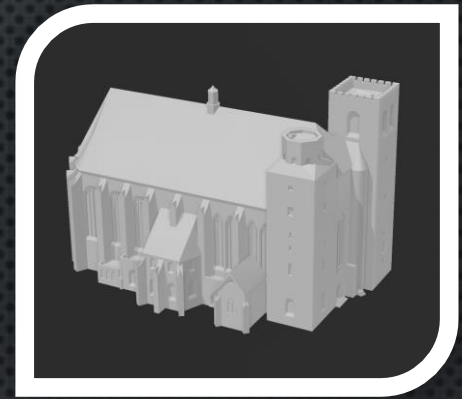
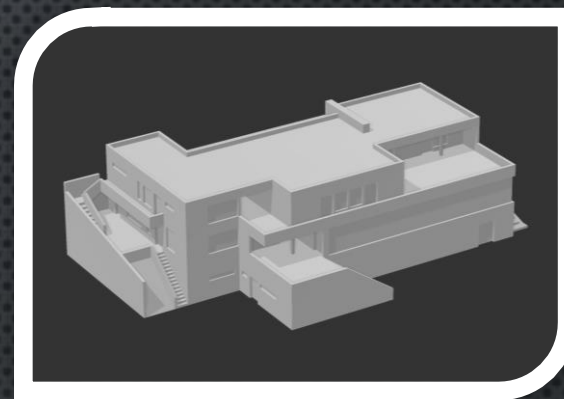
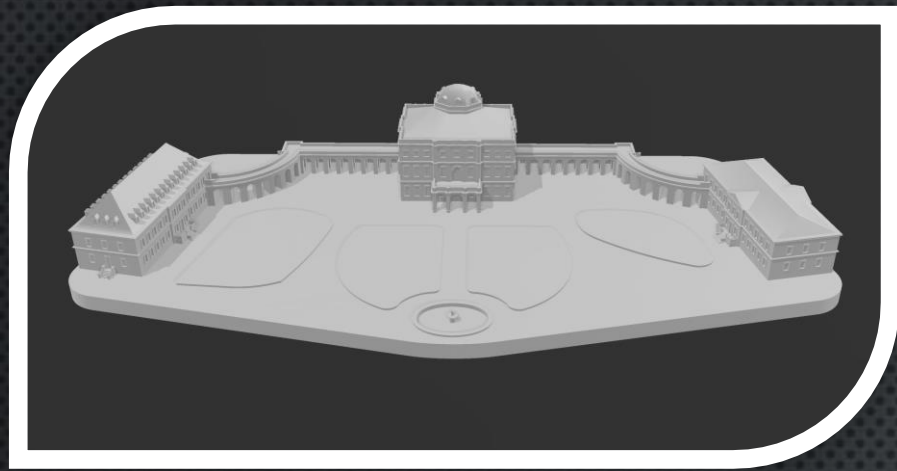
- MODELLING **ARCHITECTURAL LANDMARKS** FOR PEOPLE WITH SEVERE VISUAL IMPAIRMENT
- ONE LANDMARK FOR EACH OF 14 REGIONS IN CZECHIA
 - CASTLES & PALACES
 - CHURCHES & CATHEDRALS
 - HISTORICAL BUILDINGS
 - RURAL ARCHITECTURE
 - MODERN BUILDINGS



FROM TACTILE MAPS BACK TO 3D MODELS

- AIMING TO PRESENT ...
 - DIFFERENCES IN SIZE/DIMENSIONS
 - STRUCTURE OF BUILDINGS
 - ARCHITECTONIC STYLES
 - INTERESTING HISTORICAL FACTS COMPATIBLE WITH EDUCATION
- SUPPLEMENTED WITH EXCURSIONS
 - USING THE MODELS IN THE FIELD
 - MIXING THE IMAGINATION OF REAL WORLD & TANGIBLE MODEL

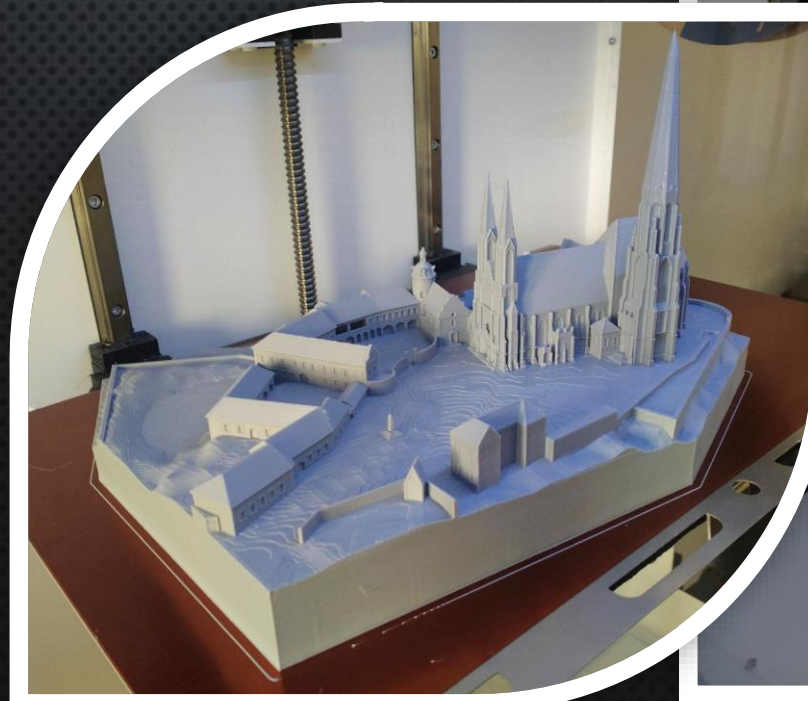
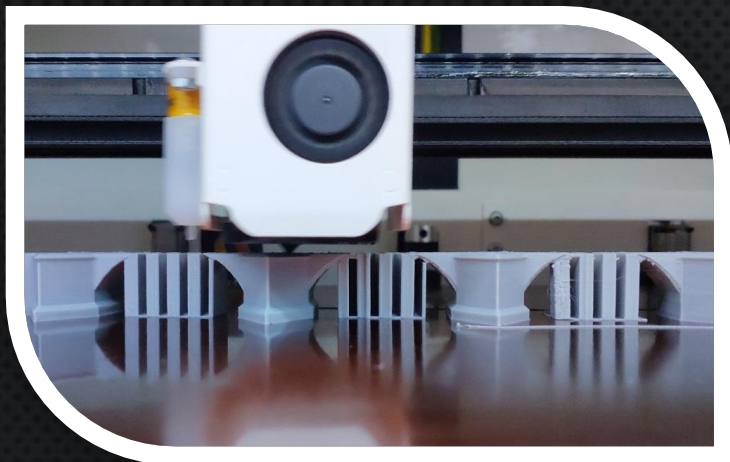




MAKING MODELS LARGE

- **CRAFTBOT FLOW XL**

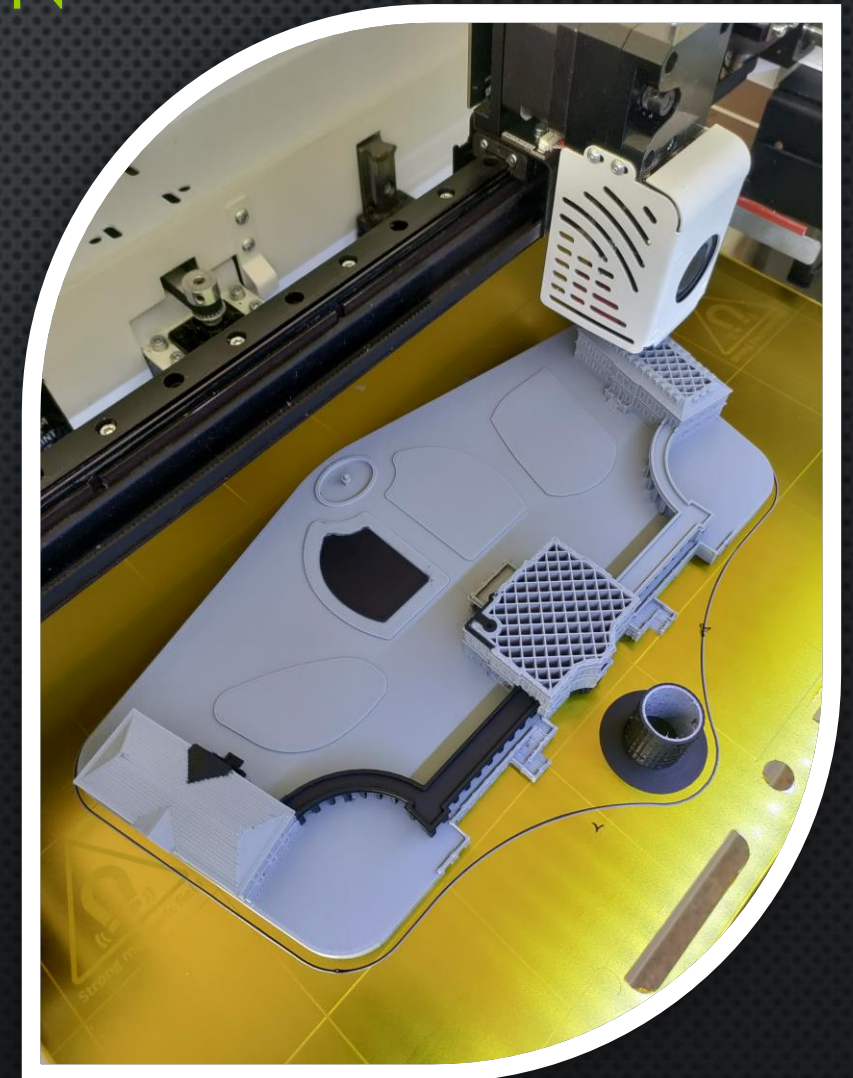
- 300 × 200 × 500 MM BUILDING VOLUME
- DUAL EXTRUSION



NEED OF SOFTWARE MODIFICATION

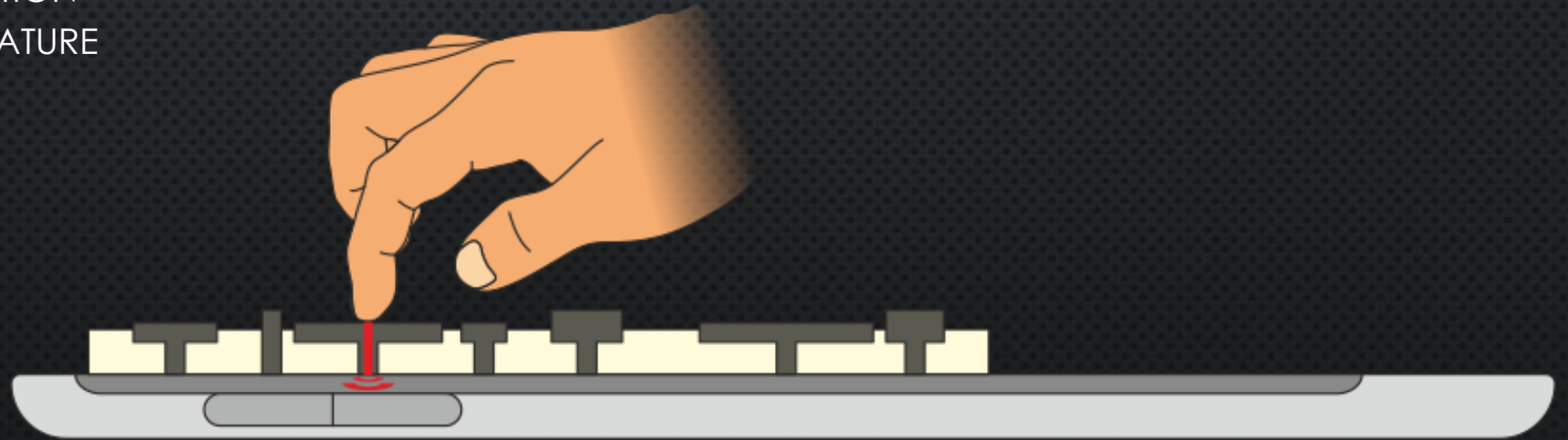
- INTERACTIVE ELEMENTS NOT ALWAYS RECOGNISABLE
- DIFFERENT APPROACH FOR AUDITIVE DESCRIPTION

TACTILE
⇒ EXPLORE
TALK



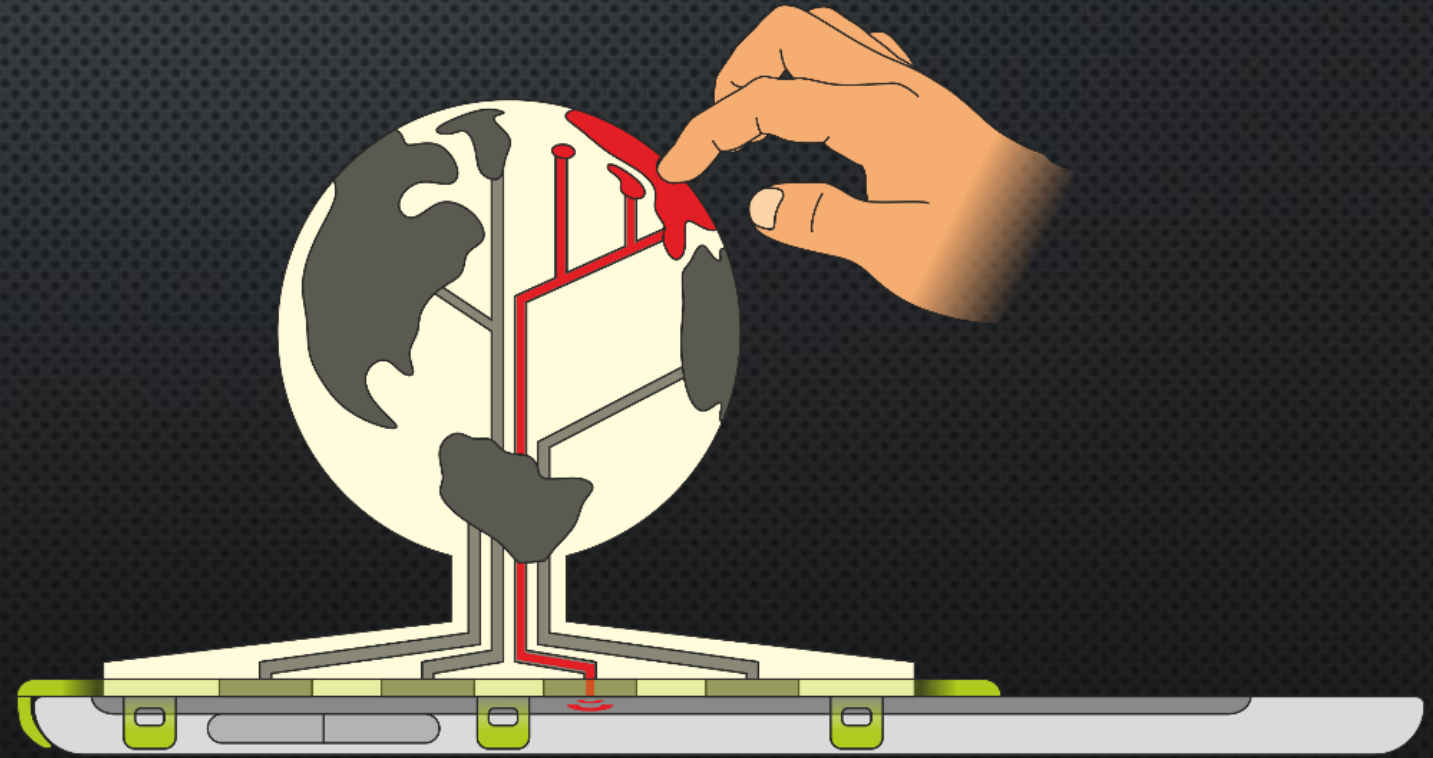
BEFORE (FOR TACTILE MAPS)

- NO INTERACTION IMMEDIATELY
- AFTER 1 SECOND HOLDING
 - VIBRATIONS
 - AUDITIVE DESCRIPTION OF RESPECTIVE FEATURE

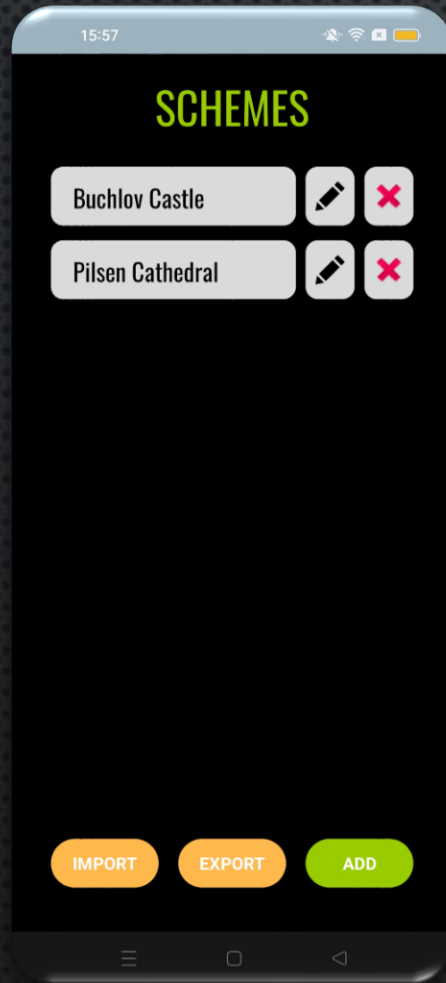


NOW (FOR 3D MODELS)

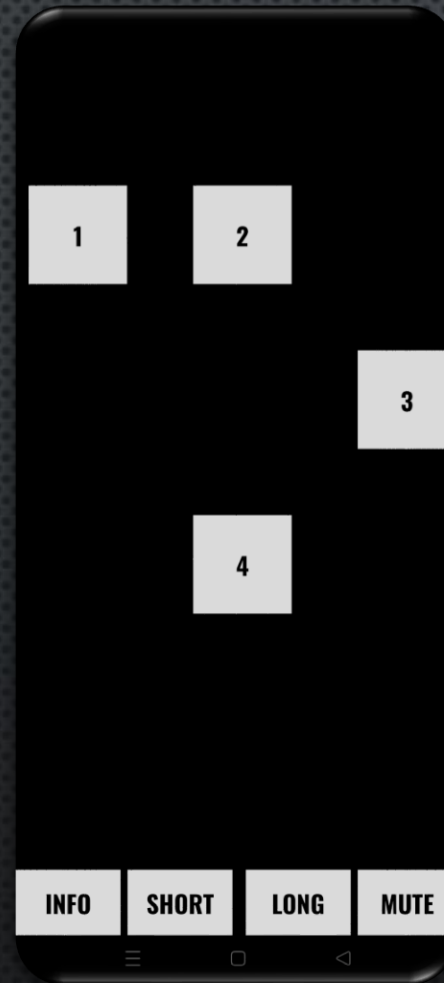
- IMMEDIATELY AND DURING ALL TIME OF A CONTACT
 - VIBRATIONS
- AFTER 3 SECONDS HOLDING
 - AUDITIVE DESCRIPTION OF RESPECTIVE FEATURE



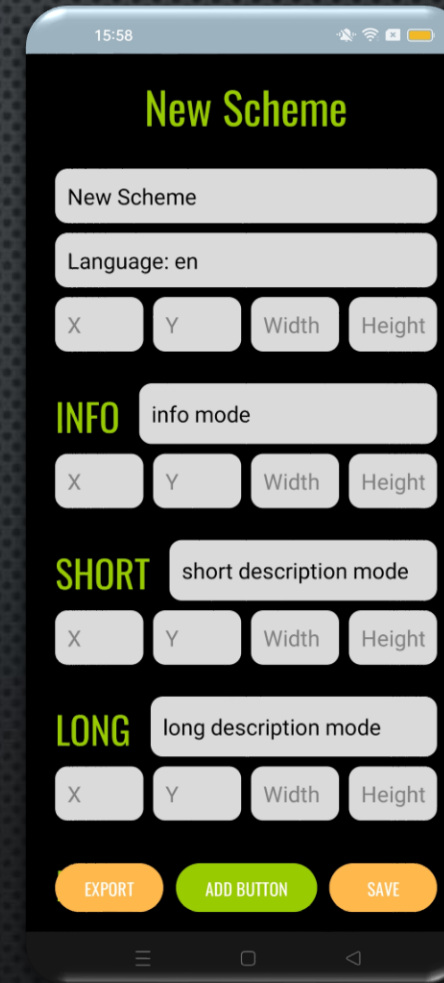
NEW FUNCTIONALITY



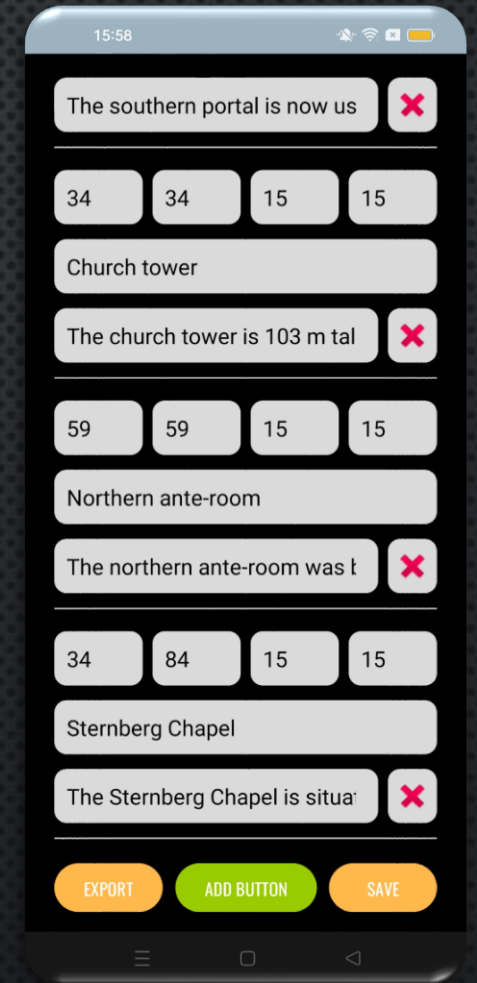
- MAIN MENU WITH THE LIST OF SCHEMES



- ACTIVE MODE FOR EACH SCHEME

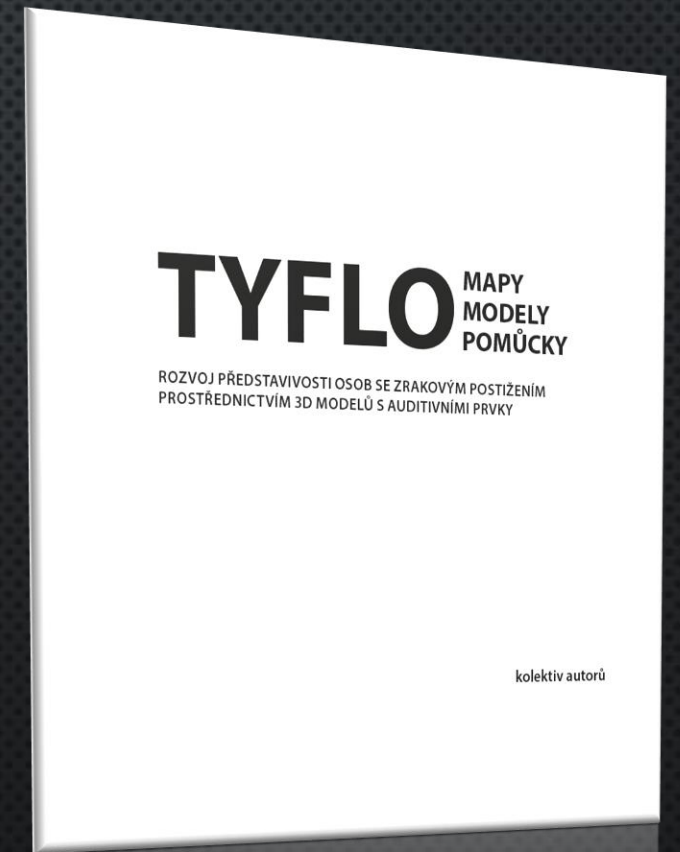
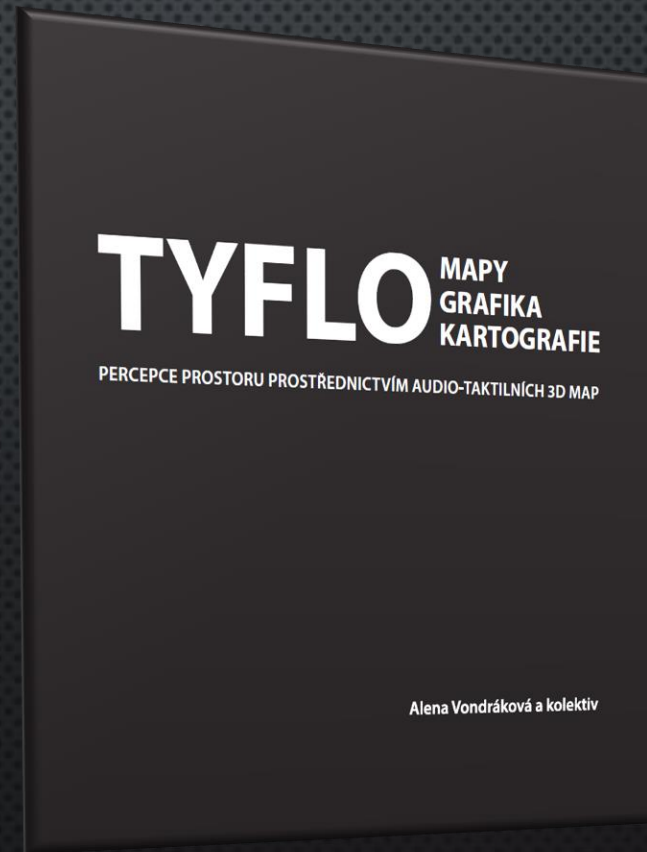


- EDITING MODE FOR DESIGNING NEW OR EDITING EXISTING SCHEMES



BOOK SERIES

- TACTILE MAPS-GRAPHICS-
-MODELS-CARTOGRAPHY
- COMPLEX BOOKS ABOUT
TACTILE CARTOGRAPHY &
TOUCHIT 3D TECHNOLOGY
- IN CZECH LANGUAGE
- AVAILABLE ONLINE FREE
- [TACTILEMAPS.UPOL.CZ/
PROJECT-OUTPUTS](https://tactilemaps.upol.cz/project-outputs)



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