MASTER OF SCIENCES - BIOMEDICAL ENGINEERING
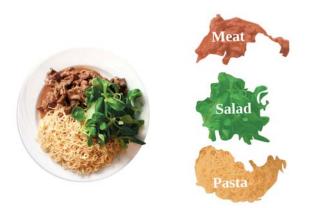
MASTER THESIS PROPOSAL

Food item recognition

Diet-related chronic diseases like obesity or diabetes have become a major health concern over the last decades. An effortless food intake logging can improve the daily food intake and provide ways to better regulate ones diet [1]. The late breakthrough of convolutional neural networks have been proved to increase the performance of such tasks in many applications including portion analysis [2].

Within the framework of the proposed MSc Thesis project, state of the art machine learning systems for food item recognition will be developed and evaluated. A number of different datasets will be used for the purposes of the project (more than 7000 annotated food images). The candidate will be working in a multidisciplinary team of clinicians and engineers. The project will be conducted at the ARTORG Center for Biomedical Engineering Research of the University of Bern, in close collaboration with the Department of Diabetology, Endocrinology, Nutritional Medicine & Metabolism of the Bern University Hospital "Inselspital".

Requirements:
- Good programming skills in MATLAB and/or Python
- Image processing and/or machine learning background
- Excellent English (written, spoken)

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References
[1] Rhyner D, Loher H, Dehais J, Anthimopoulos M, Shevchik S, Botwey RH, Duke D, Stettler C, Diem P, Mougiakakou S, "Carbohydrate Estimation by a Mobile Phone-Based System Versus Self-Estimations of Individuals With Type 1 Diabetes Mellitus: A Comparative Study", J Med Internet Res 2016;18(5):e101
[2] Christodoulidis, Stergios, Marios Anthimopoulos, and Stavroula Mougiakakou. "Food Recognition for Dietary Assessment Using Deep Convolutional Neural Networks." International Conference on Image Analysis and Processing. Springer International Publishing, 2015.