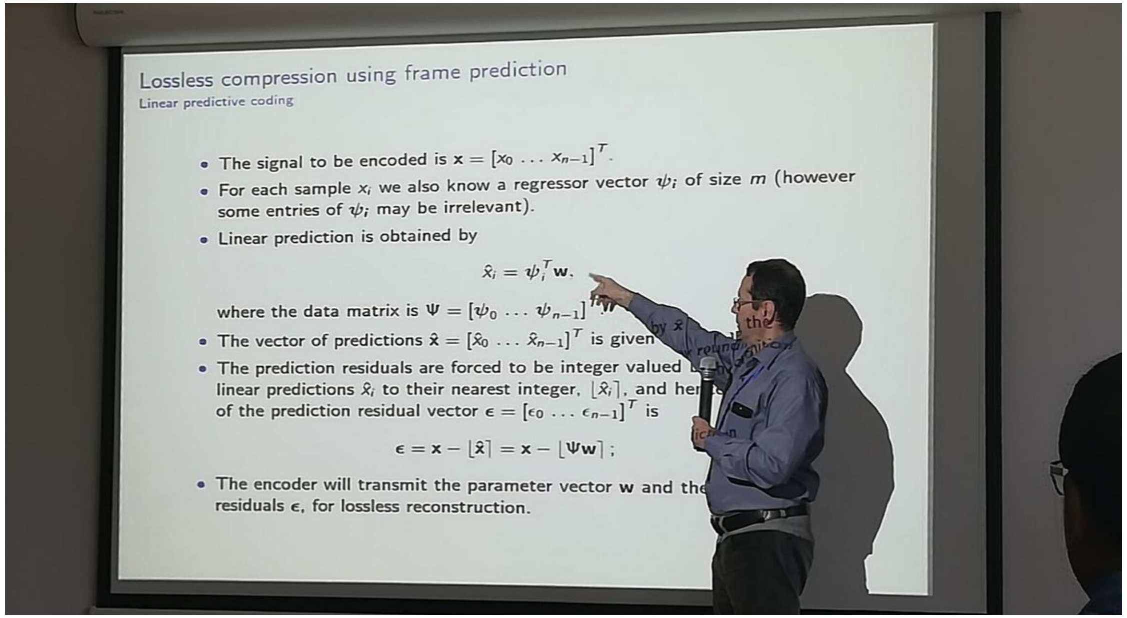
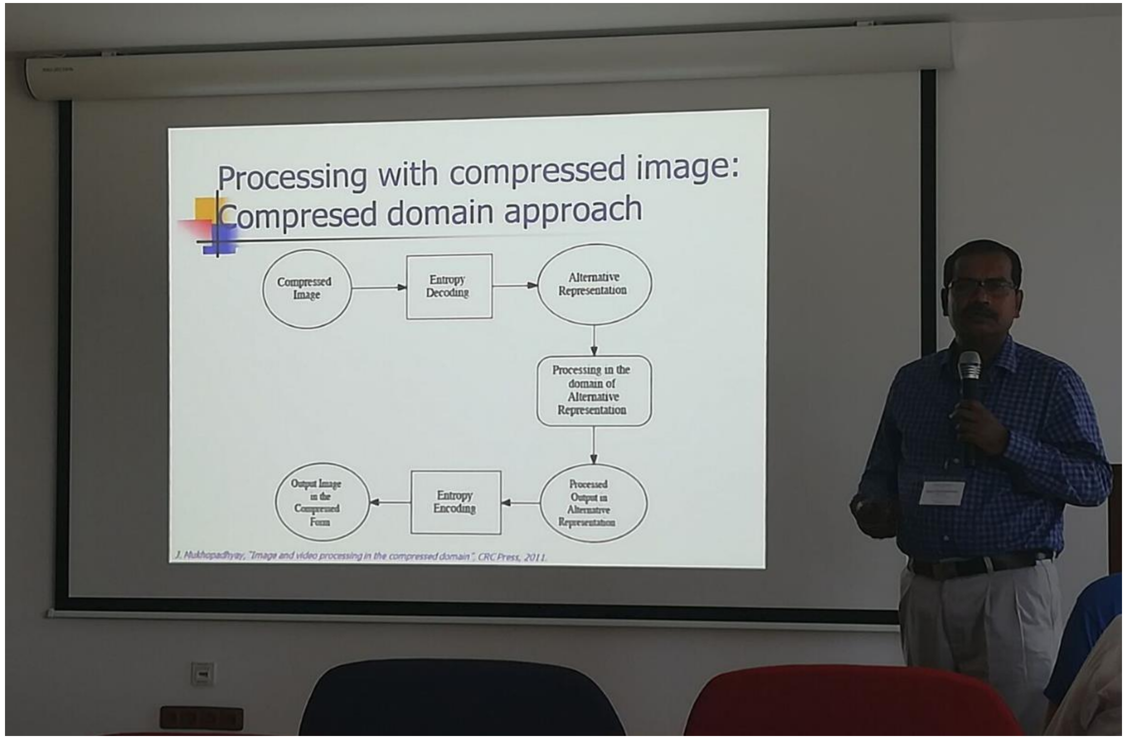
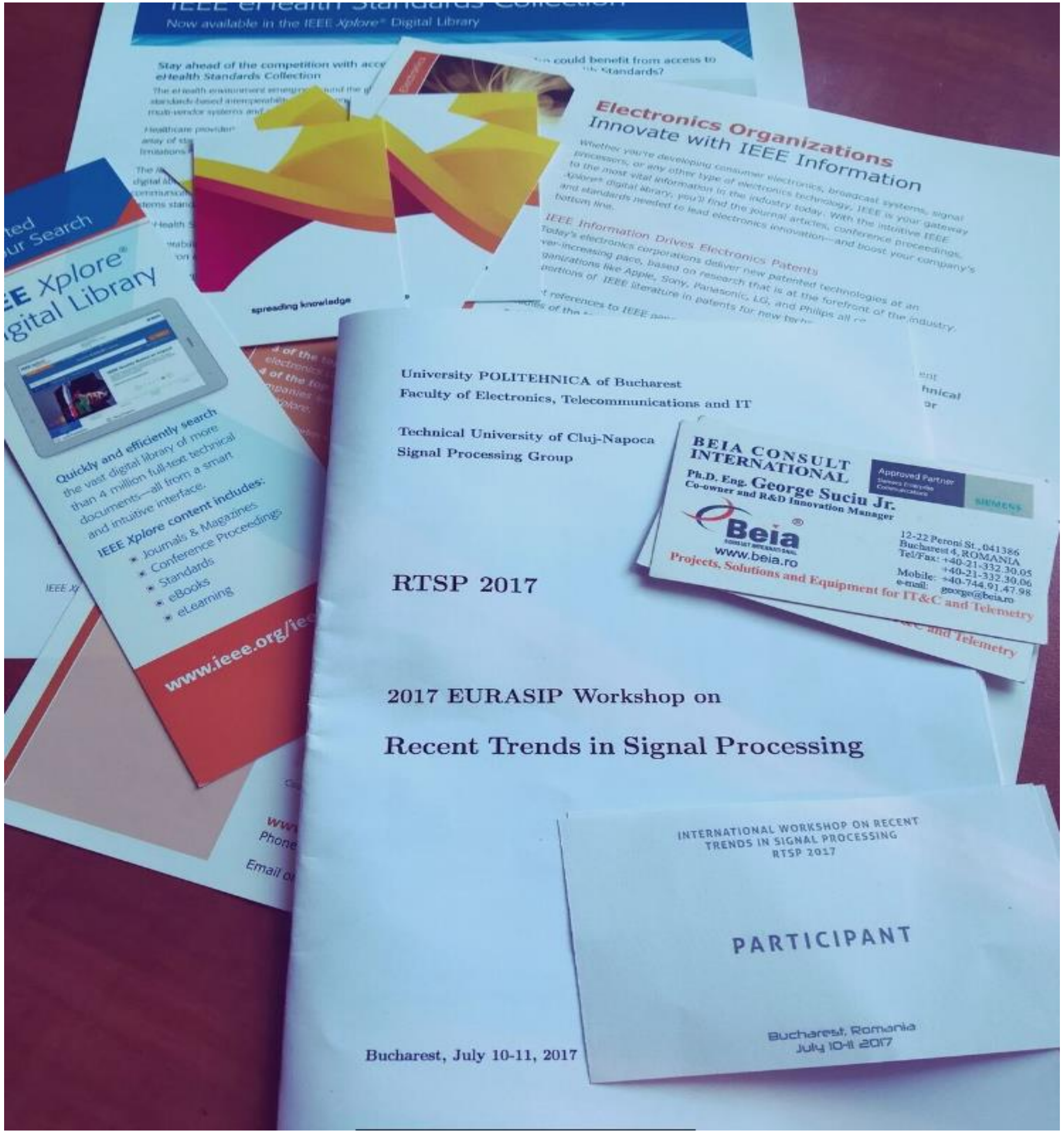

Lossless compression using frame prediction
Linear predictive coding
The signal to be encoded is $\mathbf{x} = [x_0 \ldots x_{n-1}]^T$.
For each sample x_i we also know a regressor vector ψ_i of size m (however some entries of ψ_i may be irrelevant).
Linear prediction is obtained by
$\hat{x}_i = \psi_i^T \mathbf{w}$,
where the data matrix is $\Psi = [\psi_0 \ldots \psi_{n-1}]$
The vector of predictions $\hat{\mathbf{x}} = [\hat{x}_0 \ldots \hat{x}_{n-1}]^T$ is given
The prediction residuals are forced to be integer valued
linear predictions $\hat{x}_i$ to their nearest integer, $\lfloor \hat{x}_i \rceil$, and her
of the prediction residual vector $\epsilon = [\epsilon_0 \ldots \epsilon_{n-1}]^T$ is
$\epsilon = \mathbf{x} - \lfloor \hat{\mathbf{x}} \rceil = \mathbf{x} - \lfloor \Psi \mathbf{w} \rceil$;
The encoder will transmit the parameter vector $\mathbf{w}$ and the
residuals ϵ, for lossless reconstruction.


Processing with compressed image:
Compressed domain approach
Compressed Image
Entropy Decoding
Alternative Representation
Processing in the domain of Alternative Representation
Processed Output in Alternative Representation
Entropy Encoding
Output Image in the Compressed Form
J. Mukhopadhyay, "Image and video processing in the compressed domain", CRC Press, 2011.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