HEARING LOSS SCREENING THROUGH CELL PHONES
MIT and UFRN – UERN Collaboration
**Cell Phone Hearing Loss Screening**

- Brazilian federal law requires a hearing test to be done in the first week of birth

- ~5.7 million Brazilians have some degree of hearing loss

- 6% of children have hearing loss in first three years of life

- Costs in Brazil are high/ equipment always an import
Motivation

Applications

Research Team

Infrastructure

Huge Health Care Demand

Development of New Technology to Improve Health Care of Poorly Assisted Communities
Rio Grande do Norte (RN)

RN at a glance

1) Area - Total 52,796.791 km²
2) Population 2010 - Estimated 3,168,027
3) Density - 60 habitants / km²
4) Economy - GDP R $ 25.481 billion
5) GDP per capita - U.S. $ 8,203
6) Life expectation 2008 - 70.8 years
7) Child mortality 2008 - 3.35%
8) Illiteracy Rate - 20.0%
9) Birth Rate 2009 - ~47K per year
There are four hospitals that belongs to the university:

- Onofre Lopes University Hospital
- Ana Bezerra University Hospital
- Januário Cicco Maternity School
- Children Hospital
## Cell Phone Network

<table>
<thead>
<tr>
<th>Cell Provider</th>
<th>Cities with Coverage</th>
<th>Population with Net</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIVO</td>
<td>3.702</td>
<td>90.7%</td>
</tr>
<tr>
<td>CLARO</td>
<td>3.568</td>
<td>90.6%</td>
</tr>
<tr>
<td>OI</td>
<td>3.316</td>
<td>87.9%</td>
</tr>
<tr>
<td>TIM</td>
<td>3.211</td>
<td>89.6%</td>
</tr>
<tr>
<td>CTBC</td>
<td>99</td>
<td>1.9%</td>
</tr>
<tr>
<td>AEIOU</td>
<td>5</td>
<td>7.6%</td>
</tr>
<tr>
<td>SERCOMTEL</td>
<td>2</td>
<td>0.3%</td>
</tr>
<tr>
<td>Brazil</td>
<td>5.564</td>
<td>99.99%</td>
</tr>
</tbody>
</table>
Growing of Cell Phones

Growing Numbers of the Cell Phones in Brazil

Brazil is a huge market, 242.2 millions of cells phones in 2011, representing 123.9 cel/100 hab.

Graph showing increasing number of cell phone users over time (2010, 2011) in Brazil has been removed due to copyright restrictions.
Hearing Loss Screening Through Cell Phones

1. Hearing Assessment Questionnaire

2. Distortion Product Acoustic Emissions (DPOAE)
GOAL: Obtain Risk Factors:

Family History

Hospital stay > 5 days

utero infections

Ototoxic drugs

Syndromes related to hearing loss
DPOAE Test
Goal
Possible Project Goals

1) Propose a plan with metrics for evaluating and quantifying the cost-effectiveness of the project based on the current practices in Brazil.

2) Propose sustainable business plan for a global market place

3) Developing the APP