

MOBILE PHONE DATA CAN PREDICT STUDENT FUTURE COLLEGE MAJORS

Fadi Habhab, Asim AL-Ihabi, Ahmed Hawsawi

s436011096@st.uqu.edu.sa, s436000592@st.uqu.edu.sa, s436011427@st.uqu.edu.sa

Advisor: Dr.Ghassan F. Bati , gfbati@uqu.edu.sa



WHAT

- College major affects one's future career path
- Choosing an appropriate college major for a person plays an important role in their social life
- Traditional methods to choosing college majors are surveys and instruments
- We propose a method that can predict college majors using mobile phone metadata: (a) low-cost (b) fast (c) automatic (d) scalable

WHY

- IoP vision requires → Creation of Sociological Profiles (Miranda, et al., 2015)
- To complement traditional surveys used in college majors prediction

STUDY

- Connecting socio-mobile behavior data (phoneotypes) with choosing college majors
- Obtained backups of (Calls and SMS) logs, NOT CONTENT from 30 participants for 8 weeks
- Surveys related to choosing college majors and demographics

HOW

- Modeling college majors as a function of these mobile phone metadata using various machine learning classification algorithms

SAMPLE RESULTS

- Your mobile phone knows your college major!
- (Phoneotype) models yield better AUC, Accuracy, and F1 than demography models

Selected Features for Different Prediction Models

Demography Only	Income, Age, Social Status
Phoneotype Only	Missed Calls Ratio, Missed Calls, Strong Ties Ratio, Weak Ties Ratio, Incoming Calls, Outgoing SMS, Daily Activity Ratio (Calls).

Results of Predicting College Majors Using Various Classification Methods

Method	Phoneotype			Demography		
	AUC	CA	F1	AUC	CA	F1
SVM	0.722	0.067	0.066	0.634	0.000	0.000
NaïveBayes	0.599	0.267	0.247	0.276	0.033	0.033
Neural Network	0.505	0.333	0.316	0.294	0.067	0.063
Tree	0.497	0.300	0.282	0.263	0.067	0.052
KNN	0.468	0.167	0.131	0.304	0.133	0.083
CN2 rule inducer	0.455	0.167	0.164	0.294	0.067	0.052
Random Forest	0.399	0.267	0.232	0.250	0.033	0.040
Log Regression	0.320	0.233	0.216	0.180	0.133	0.083
Constant	0.153	0.067	0.050	0.000	0.000	0.000

MOBILE PHONE USE PATTERNS CAN PREDICT STUDENTS FUTURE COLLEGE MAJORS

More Information?



Fadi



Asim



Ahmed

Acknowledgment

Fadi, Asim, and Ahmed thank Umm Al-Qura University, Makkah, Saudi Arabia. Also, we are thankful to our advisor Dr. Ghassan F. Bati for his valuable advices through this journey. Finally, we are grateful for our families for their prayers and great support and the push to achieve success.