269 lines - 26 Removals

```
/* Edge Impulse Arduino examples
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 *
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 */

// If your target is limited in memory remove this macro to save 10K RAM
#define EIDSP_QUANTIZE_FILTERBANK   0

/**
 * Define the number of slices per model window. E.g. a model window of 1000 ms
 * with slices per model window set to 4. Results in a slice size of 250 ms.
 * For more info: https://docs.edgeimpulse.com/docs/continuous-audio-sampling
 */
//#define EI_CLASSIFIER_SLICES_PER_MODEL_WINDOW 3

/*
 ** NOTE: If you run into TFLite arena allocation issu
```

330 lines + 89 Additions

```


/* Edge Impulse Arduino examples
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 *
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 * SOFTWARE.
 */
#include "RPC.h"  // comes with the mbed board installation

// If your target is limited in memory remove this macro to save 10K RAM
#define EIDSP_QUANTIZE_FILTERBANK   0

/**
 * Define the number of slices per model window. E.g. a model window of 1000 ms
 * with slices per model window set to 4. Results in a slice size of 250 ms.
 * For more info: https://docs.edgeimpulse.com/docs/continuous-audio-sampling
 */
//#define EI_CLASSIFIER_SLICES_PER_MODEL_WINDOW 3

/*
 ** NOTE: If you run into TFLite arena allocation issu
```

```
e.
 **
 ** This may be due to may dynamic memory fragmentation.
 ** Try defining "-DEI_CLASSIFIER_ALLOCATION_STATIC" in boards.local.txt (create
 ** if it doesn't exist) and copy this file to
 ** `<ARDUINO_CORE_INSTALL_PATH>/arduino/hardware/<mbed_core>/<core_version>/`.
 **
 ** See
 ** (https://support.arduino.cc/hc/en-us/articles/360012076960-Where-are-the-installed-cores-located-)
 ** to find where Arduino installs cores on your machine.
 **
 ** If the problem persists then there's not enough memory for this model and application.
 */

/* Includes ---------------------------------------------------------------- */
#include <PDM.h>
#include <FYP_Direction_inferencing.h>

/** Audio buffers, pointers and selectors */
typedef struct {
    signed short *buffers[2];
    unsigned char buf_select;
    unsigned char buf_ready;
    unsigned int buf_count;
    unsigned int n_samples;
} inference_t;

static inference_t inference;
static volatile bool record_ready = false;
// static signed short *sampleBuffer;
static signed short sampleBuffer[2048];
static bool debug_nn = false; // Set this to true to see e.g. features generated from the raw signal
static int print_results = -(EI_CLASSIFIER_SLICES_PER_MODEL_WINDOW);

/**
 * @brief      Arduino setup function
 */
void setup()
{
    // put your setup code here, to run once:
```

```
e.
 **
 ** This may be due to may dynamic memory fragmentation.
 ** Try defining "-DEI_CLASSIFIER_ALLOCATION_STATIC" in boards.local.txt (create
 ** if it doesn't exist) and copy this file to
 ** `<ARDUINO_CORE_INSTALL_PATH>/arduino/hardware/<mbed_core>/<core_version>/`.
 **
 ** See
 ** (https://support.arduino.cc/hc/en-us/articles/360012076960-Where-are-the-installed-cores-located-)
 ** to find where Arduino installs cores on your machine.
 **
 ** If the problem persists then there's not enough memory for this model and application.
 */

/* Includes ---------------------------------------------------------------- */
#include <FYP_Marvin_inferencing.h>



#ifdef CORE_CM4
int pass;
int turn;
int infromM7 = D4;

#endif


int sound_analog = A6;


/** Audio buffers, pointers and selectors */
typedef struct {
    signed short *buffers[2];
    unsigned char buf_select;
    unsigned char buf_ready;
    unsigned int buf_count;
    unsigned int n_samples;
} inference_t;

static inference_t inference;
static volatile bool record_ready = false;
// static signed short *sampleBuffer;
static signed short sampleBuffer[2048];
static bool debug_nn = false; // Set this to true to see e.g. features generated from the raw signal
static int print_results = -(EI_CLASSIFIER_SLICES_PER_MODEL_WINDOW);





/**
 * @brief      Arduino setup function
 */
void setup()
{
  Serial.begin(115200);
  RPC.begin();
    // put your setup code here, to run once:
```

```
    Serial.begin(115200);

    Serial.println("Edge Impulse Inferencing Demo");

    // summary of inferencing settings (from model_metadata.h)
    ei_printf("Inferencing settings:\n");
    ei_printf("\tInterval: ");
    ei_printf_float((float)EI_CLASSIFIER_INTERVAL_MS);
    ei_printf(" ms.\n");
    ei_printf("\tFrame size: %d\n", EI_CLASSIFIER_DSP_INPUT_FRAME_SIZE);
    ei_printf("\tSample length: %d ms.\n", EI_CLASSIFIER_RAW_SAMPLE_COUNT / 16);
    ei_printf("\tNo. of classes: %d\n", sizeof(ei_classifier_inferencing_categories) /
                                            sizeof(ei_classifier_inferencing_categories[0]));

    run_classifier_init();
    if (microphone_inference_start(EI_CLASSIFIER_SLICE_SIZE) == false) {
        ei_printf("ERR: Failed to setup audio sampling\r\n");
        return;
    }
}

/**
 * @brief      Arduino main function. Runs the inferencing loop.
 */
void loop()
{
    bool m = microphone_inference_record();
    if (!m) {
        ei_printf("ERR: Failed to record audio...\n");
        return;
    }

    signal_t signal;
    signal.total_length = EI_CLASSIFIER_SLICE_SIZE;
    signal.get_data = &microphone_audio_signal_get_data;
    ei_impulse_result_t result = {0};

    EI_IMPULSE_ERROR r = run_classifier_continuous(&signal, &result, debug_nn);
    if (r != EI_IMPULSE_OK) {
        ei_printf("ERR: Failed to run classifier (%d)\n", r);
        return;
```

```

     RPC.println("Edge Impulse Inferencing Demo");

    // summary of inferencing settings (from model_metadata.h)
    ei_printf("Inferencing settings:\n");
    ei_printf("\tInterval: ");
    ei_printf_float((float)EI_CLASSIFIER_INTERVAL_MS);
    ei_printf(" ms.\n");
    ei_printf("\tFrame size: %d\n", EI_CLASSIFIER_DSP_INPUT_FRAME_SIZE);
    ei_printf("\tSample length: %d ms.\n", EI_CLASSIFIER_RAW_SAMPLE_COUNT / 16);
    ei_printf("\tNo. of classes: %d\n", sizeof(ei_classifier_inferencing_categories) /
                                            sizeof(ei_classifier_inferencing_categories[0]));

    run_classifier_init();
    if (microphone_inference_start(EI_CLASSIFIER_SLICE_SIZE) == false) {
        ei_printf("ERR: Failed to setup audio sampling\r\n");
        return;
    }

    #ifdef CORE_CM4
      pass = 0;
      pinMode(infromM7, INPUT);
      pinMode(sound_analog,INPUT);
  #endif
}

/**
 * @brief      Arduino main function. Runs the inferencing loop.
 */
void loop()
{

  turn = digitalRead(infromM7);

  if (turn == 0){

    pass = 0;
    auto res = RPC.call("setVar", pass).as<int>();
    bool m = microphone_inference_record();
    if (!m) {
        ei_printf("ERR: Failed to record audio...\n");
        return;
    }

    signal_t signal;
    signal.total_length = EI_CLASSIFIER_SLICE_SIZE;
    signal.get_data = &microphone_audio_signal_get_data;
    ei_impulse_result_t result = {0};

    EI_IMPULSE_ERROR r = run_classifier_continuous(&signal, &result, debug_nn);
    if (r != EI_IMPULSE_OK) {
        ei_printf("ERR: Failed to run classifier (%d)\n", r);
        return;
    }

    if (++print_results >= (EI_CLASSIFIER_SLICES_PER_MODEL_WINDOW)) {
        // print the predictions
        ei_printf("Predictions ");
        ei_printf("(DSP: %d ms., Classification: %d ms., Anomaly: %d ms.)",
            result.timing.dsp, result.timing.classification, result.timing.anomaly);
        ei_printf(": \n");
        for (size_t ix = 0; ix < EI_CLASSIFIER_LABEL_COUNT; ix++) {
            ei_printf("    %s: ", result.classification[ix].label);
```

```
    }

    if (++print_results >= (EI_CLASSIFIER_SLICES_PER_MODEL_WINDOW)) {



        // print the predictions
        ei_printf("Predictions ");
        ei_printf("(DSP: %d ms., Classification: %d ms., Anomaly: %d ms.)",
            result.timing.dsp, result.timing.classification, result.timing.anomaly);
        ei_printf(": \n");


        RPC.println("============================");
        RPC.println("Sending From M4 core:");

        RPC.print("Predictions ");
        RPC.println("(DSP: " + String(result.timing.dsp) + " ms., Classification: " + String(result.timing.classification) + " ms., Anomaly: " + String(result.timing.anomaly) + " ms.)");

        for (size_t ix = 0; ix < EI_CLASSIFIER_LABEL_COUNT; ix++) {
            ei_printf("    %s: ", result.classification[ix].label);
```